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SUSTAINABLE DEVELOPMENT GOALS

BOOK OF ABSTRACTS

"A MULTIDISCIPLINARY APPROACH TO SUSTAINABLE DEVELOPMENT GOALS"

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14–15 November 2025, Bitola

BOOK OF ABSTRACTS

International Scientific Conference on Sustainable Development Goals

"A Multidisciplinary Approach to Sustainable Development Goals"

Hosted by:
University "St. Kliment Ohridski" – Bitola
Republic of North Macedonia
14–15 November 2025, Bitola

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Sustainable development is the pathway to the future we want for all. It offers a framework to generate economic growth, achieve social justice, exercise environmental stewardship and strengthen governance.

Ban Ki-moon

FOREWORD

In celebration of World Science Day for Peace and Development, University “St. Kliment Ohridski” - Bitola proudly hosted its annual international scientific conference. This event served as a dynamic platform for multidisciplinary dialogue, innovation, and transformative impact.

Gathered at Bitola's historic House of the Army, the conference united scholars, researchers, and professionals from across the globe, all committed to advancing science in the service of peace and sustainable development. It provided an inspiring forum for a comprehensive examination of the United Nations 2030 Agenda, bringing together diverse perspectives to address the pressing global challenges outlined in the Sustainable Development Goals (SDGs).

It is with great pleasure that we present this Book of Abstracts. This volume is far more than a program guide; it is a vibrant tapestry of contemporary thought, charting the intellectual frontiers we are collectively exploring. The research within these pages reflects a global commitment to one of the most critical paradigms of our time: the pursuit of sustainable and equitable development for all, as framed by the SDGs.

This collection is a powerful testament to the power of interdisciplinary dialogue. Within these pages, the data-driven language of engineering converses with the nuanced analyses of law and political science. The clinical observations of healthcare align with systemic perspectives in economics and public policy. We journey from the microscopic world of microbial communities in Lake Prespa to the vast, abstract realms of artificial intelligence governance.

Each abstract represents a significant investment of inquiry and a contribution to our shared knowledge. They are the starting points for the discussions, debates, and collaborations that are the lifeblood of this conference.

We extend our deepest gratitude to the authors, reviewers, and organizers whose dedicated efforts have made this collection possible. It is our sincere hope that this Book of Abstracts will serve not only as a guide but as a source of inspiration and a catalyst for new ideas.

We invite you to explore these pages, discover connections across disciplines, and engage with the ideas presented. May this collection ignite conversations that challenge assumptions, forge new partnerships, and ultimately help build a more sustainable, just, and prosperous world.

Warm regards,

Prof. Dr. Goran Ilik
Chair of the AISC 2025 Organizing Committee
University “St. Kliment Ohridski” - Bitola

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EFFECT OF COMBUSTION CHAMBER DIAMETER ON NOx EMISSIONS IN A LIQUID FUEL COMBUSTION STEAM BOILER

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ABSTRACT

Introduction: Industrial boilers are significant stationary sources of nitrogen oxides (NOx). Reducing the volumetric load rate of the combustion chamber through geometric changes can reduce the maximum flame temperature and NOx formation, but limited field data exists under fixed operating conditions.

Methods: An A/B comparison was performed on a 495 kW combustion chamber boiler configured with two combustion chamber diameters, keeping the rated output and heating surface constant: Ø 550 mm (boiler I) and Ø 650 mm (boiler II). At half load (Q = 272 kW) and full load (Q = 495 kW), the NOx concentration (mg/m³), thermal efficiency (η), and combustion chamber outlet temperature (°C) were measured. The volumetric load rate of the combustion chamber Qvf (kW/m³) was calculated for each configuration. The mass emission rates were estimated based on a measured flue gas flow rate of ≈770 m³/h per boiler.

Results: Increasing the combustion chamber diameter from 550 mm to 650 mm reduced Qvf by 29% (1358 → 963 kW/m³) and lowered the NOx concentration at both loads: from 111 → 101 mg/m³ (half load) and 124 → 113 mg/m³ (full load). At full load, the outlet temperature dropped from 920 °C (Ø550) to 903 °C (Ø650). Thermal efficiency remained almost unchanged (92.3% compared to 92.1% at full load; 93.2% compared to 92.8% at half load; ≤0.4 percentage points difference). The reduction of 11 mg/m³ at full load corresponds to an emission reduction of ≈8.5 g NOx/h (≈85 g over 10 h).

Discussion: Reducing the volumetric load rate of the combustion chamber by slightly increasing the combustion chamber diameter leads to a consistent reduction in NOx without any loss of performance or significant loss of efficiency under real operating conditions. Optimizing the combustion chamber geometry is a practical, cost-effective way to control NOx emissions in industrial liquid-fuel boilers.

Keywords: NOx; Industrial boilers; Combustion chamber geometry; Volumetric combustion chamber load; Combustion temperature; Emission control.

NUTRICON CONGRESS - INTERDISCIPLINARY SCIENTIFIC APPROACH IN NUTRITION: A REVIEW

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ABSTRACT

Introduction: Food is the primary source of energy and the most essential building block of the human body and mind. To be fully understood, food must be examined through an interdisciplinary scientific approach rather than being compartmentalized in narrow scientific fields. This abstract highlights the need for interdisciplinary scientific gatherings in nutrition, as exemplified by the NUTRICON Congress.

Methods: The analysis examines the United Nations Sustainable Development Goals framework, particularly SDGs 2 (Zero Hunger) and 17 (Partnerships for the Goals), to contextualize the importance of multidisciplinary cooperation in addressing food and nutrition challenges.

Results: The NUTRICON Congress, established in 2014, has become the most significant international and interdisciplinary congress in the food sector. It brings together food technologists, engineers, medical and dental doctors, and nutritionists to comprehensively address issues in food production, processing, quality, safety, health, and nutrition. To date, it has engaged over 1,150 authors and participants worldwide.

Discussion: The congress demonstrates how interdisciplinary collaboration can bridge gaps between different scientific domains to address complex food and nutrition challenges. The upcoming 2026 congress in Ohrid, Macedonia (June 3-5), will continue this tradition of fostering scientific cooperation across disciplines to advance food security, nutrition, and sustainable agriculture in line with the UN Sustainable Development Goals.

Keywords: Interdisciplinary approach, Science, NUTRICON Congress, Food, Cooperation

ACADEMIC LEADERSHIP AND EDUCATIONAL POLICY IN GEORGIA: PATHWAYS TO ACHIEVING SDG 4 ON QUALITY EDUCATION

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ABSTRACT

Introduction: Achieving Sustainable Development Goal 4 (SDG 4) – ensuring inclusive and equitable quality education – remains a pressing challenge within Georgia's higher education system. Recent reforms, such as strengthening university autonomy and implementing internal quality assurance systems, have provided a policy framework, yet their practical realization largely depends on academic leadership. In Georgia, academic leaders play a pivotal role in translating national education policies into institutional strategies that directly affect teaching quality, student engagement, and accountability. This study explores how Georgian higher education institutions employ leadership practices to advance the implementation of SDG 4.

Methods: A mixed-methods design was used, combining case studies of Georgian universities, analysis of education policy and accreditation reports, and semi-structured interviews with academic leaders. Survey data from faculty were also collected. Findings were examined through thematic coding and statistical analysis to assess leadership practices in implementing SDG 4.

Results: Preliminary findings suggest that proactive leadership, collaborative governance structures, and continuous professional development significantly enhance policy implementation and educational outcomes. Institutions with integrated leadership models demonstrate higher levels of student engagement, the adoption of innovative teaching practices, and more equitable access to resources. However, challenges remain in aligning institutional priorities with national policy mandates, particularly under resource constraints and in contexts resistant to change.

Discussion: The study underscores the critical role of academic leadership in Georgia in bridging policy and practice. Strengthening leadership capacity, fostering participatory governance, and advancing evidence-based policy adaptation are essential to achieving SDG 4. While the results reveal positive correlations between leadership engagement and policy implementation, further longitudinal research is necessary to capture regional and institutional variations. The findings carry important implications for institutional strategy, policy refinement, and the systematic development of leadership training programs.

Keywords: academic leadership, policy implementation, SDG 4, quality education, higher education, Georgia

IRON DEFICIENCY ANEMIA IN PREGNANCY: PREVALENCE, DIAGNOSIS, AND PUBLIC HEALTH STRATEGIES

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ABSTRACT

Introduction: Iron deficiency anemia (IDA) is the most common nutritional disorder worldwide and the leading cause of anemia during pregnancy. Pregnant women are particularly vulnerable due to increased iron demands, posing risks for both maternal and fetal health. This study aims to assess the prevalence, diagnostic approaches, and public health strategies related to IDA in pregnancy.

Methods: A review of epidemiological data from the World Health Organization (WHO), relevant literature, and national health registries was conducted. Diagnostic standards based on hemoglobin concentration and serum ferritin levels were evaluated, along with screening and iron supplementation strategies within antenatal care.

Results: According to WHO data, more than 40% of pregnant women globally suffer from anemia, with iron deficiency being the leading cause. The highest prevalence is recorded in South Asia and Sub-Saharan Africa, but moderate prevalence is also seen in parts of Europe and the Balkans. Early screening and iron supplementation during pregnancy have been associated with positive outcomes, including a measurable decrease in maternal anemia and its associated complications.

Discussion: The findings highlight the need for standardized prenatal screening protocols and universal supplementation policies. Barriers include limited access to health services, lack of awareness, and low adherence to supplementation. Improving maternal health requires strengthened public health initiatives, nutrition education, and equitable access to prenatal care. Further research is needed to optimize the timing and delivery of interventions.

Keywords: iron deficiency, anemia, pregnancy, maternal health, supplementation

NON-GOVERNMENTAL ORGANIZATIONS AND HUMAN SECURITY: CONTRIBUTION TO THE IMPLEMENTATION OF THE 2030 AGENDA IN NORTH MACEDONIA

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ABSTRACT

Introduction: In North Macedonia, Non-Governmental Organizations (NGOs) play an important role by addressing specific Sustainable Development Goals (SDGs) themes that prioritize human security. This study aims to answer the research question: How engaged are NGOs in North Macedonia in fulfilling the SDGs that touch on human security themes? The hypothesis is that NGOs in North Macedonia are moderately engaged in achieving the SDGs due to limited information and financial opportunities.

Methods: The methodology used in our scientific paper is based on a qualitative analysis of United Nations reports on the SDGs in North Macedonia, the Government of North Macedonia's strategic documents, and NGOs' reports on their engagement with the SDGs.

Results: Some NGOs in North Macedonia are engaged in achieving the SDGs, with a special emphasis on human security. It is expected that further analysis will establish that NGOs play an important role in human security, as they operate at the local level and can more easily foster regional cooperation that advances the SDGs with a human security character.

Discussion: NGOs in North Macedonia are an important factor in connecting sustainable development and human security by engaging in work aligned with the SDGs across various themes. Their efforts to fulfill the SDGs with a human security character are constrained by the limited support they receive from institutions and donors. Strengthening capacities, creating new opportunities, and providing greater institutional and financial support are essential to their commitment to fulfilling the SDGs.

Keywords: Non-Governmental Organizations, Sustainable Development Goals, Human Security, Agenda 2030, North Macedonia,

DO DIFFERENT TAILS TELL DIFFERENT TALES? DISTRIBUTIONAL PERSPECTIVES ON GENDER EQUALITY AND SUSTAINABILITY IN INDIA

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ABSTRACT

Introduction: Despite sustained economic growth, India continues to face uneven progress toward sustainable development, constrained by gender inequality, weak institutions, and labour market rigidities. This study explores the relationship between gender equality (SDG 5) and sustainability from 1990 to 2023.

Methods: Using the Sustainable Development Index (SDI) as the outcome measure, we apply quantile regression to examine how gender equality, women's education, labour market factors, institutional quality, and per capita GDP growth shape sustainability across lower, median, and upper quantiles. This approach captures heterogeneity often hidden in mean-based models.

Results: Gender equality, proxied by the inverse of the Gender Inequality Index (1–GII), and women's mean years of schooling exert substantial and statistically significant positive effects on SDI across all quantiles. Labour market regulations consistently exert adverse effects at both lower and upper quantiles, while per capita GDP growth shows no significant association. Institutional quality has weak and mixed effects.

Discussion: Findings underscore gender inclusion and education as universal drivers of sustainability, while labour market barriers impose asymmetric constraints. The absence of a link between growth and sustainability highlights the limits of growth-led strategies. Policy implications include prioritizing gender equity, labour market reforms, and investments in women's education to achieve SDGs.

Keywords: Gender Equality, Sustainable Development, SDG 4, SDG 5, Quantile Regression, India.

ASSESSMENT OF THE ANTHROPOGENIC IMPACT ON THE WATER QUALITY OF THE TRIBUTARIES AND LITTORAL ZONE OF LAKES OHRID AND PRESPA

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ABSTRACT

Introduction: Anthropogenic pollution of river catchments poses a significant threat to aquatic ecosystems, biodiversity, and human health. Industrial effluents, agricultural runoff, and urban wastewater are among the major sources of contamination, causing organic and nutrient loading, eutrophication, and biodiversity loss. Lakes Ohrid and Prespa, the largest natural water resources in North Macedonia, are globally recognized as ancient lakes with unique endemic biodiversity. Despite their exceptional ecological value, both ecosystems are increasingly exposed to anthropogenic pressures, particularly Lake Prespa, which has been more severely affected in recent decades.

Methods: This study aimed to evaluate water quality and trophic state in the littoral zones of Lakes Ohrid and Prespa and their main tributaries, with emphasis on the influence of human activities. Seasonal sampling during 2024 was conducted at four littoral sites and three rivers in Lake Ohrid, as well as at selected sites in Lake Prespa. Physical and chemical parameters (dissolved oxygen, biodegradable organic matter, total phosphorus [TP], and total nitrogen [TN]) were analyzed, along with biological indicators (heterotrophic bacteria and total coliforms). All procedures followed standard limnological methods.

Results: The results revealed pronounced anthropogenic influence in specific areas. In Lake Prespa, the River Golema and its adjacent littoral site at Pretor exhibited high nutrient and organic loading. In Lake Ohrid, the River Velgoshka and littoral Grashnica showed similar impacts. The obtained microbiological results are correlated with the physicochemical parameters and indicate the presence of organic and fecal pollution. These findings highlight the vulnerability of littoral zones as entry points of pollution that can potentially affect the entire lake ecosystem.

Discussion: Based on Carlson's Trophic State Index (TSI) for total phosphorus, the littoral zone of Lake Prespa falls within a mesotrophic–eutrophic state, while Lake Ohrid remains in an oligo–mesotrophic state. The results emphasize the urgent need for continuous monitoring and management strategies to mitigate anthropogenic pressures and safeguard these unique lake ecosystems.

Keywords: eutrophication, anthropogenic impact, trophic index, nutrient

HEALTHCARE SYSTEM AS A FACTOR IN THE SUSTAINABLE DEVELOPMENT OF SOCIETY (ON THE EXAMPLE OF MIGRATION AND HEALTH)

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ABSTRACT

Introduction: Good health encompasses not only physical well-being, but also mental and social well-being. In the context of migration, there is the so-called "healthy migrant effect": people who decide to move are often healthier than those who stay in their home country. This means that migration itself does not necessarily lead to poor health – migrants are not automatically vulnerable in this regard.

Methods: The paper draws on several key methods, primarily applied in the social and political sciences, including comparative analysis, empirical research methods, observational methods, evaluative approaches, and content analysis. The study combines empirical data, papers, reports, and books.

Results: Having observed the situation in the field of migration management, we can say that, even in the 21st century, human rights are severely violated. Because migrants do not have adequate health care, the host government does not provide it to migrants.

Discussion: Migration can have both positive and negative impacts on the health of both migrants and host communities. Healthy migration can improve the health of the population as a whole, whereas inadequate health care can have serious consequences. Limited or delayed access to diagnostics and treatment for migrants increases the risk of infectious diseases spreading among community members. If medical care is limited to cases of serious illness, this can lead to increased costs for the health system. Delays in seeking care or interruptions in treatment for chronic infectious diseases such as tuberculosis or HIV are particularly dangerous. This not only threatens the health of the patients themselves but also increases the likelihood of further transmission. In this regard, migration should be considered as a key factor in infectious disease control strategies.

Keywords: Migration, Health, Medical care, Language Barrier, Discrimination

FORENSIC ASPECTS OF ENVIRONMENTAL PROTECTION

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ABSTRACT

Introduction: Rapid technological development, environmental pollution and especially climate change pose a serious threat to humanity. To protect the environment, in addition to other measures, effective measures to combat environmental crime are necessary. An integral part of these activities is forensic analysis of water, air, soil, and other ecosystems. The paper examines the application of forensic methods to the suppression of environmental crimes.

Methods: The methodology for preparing the paper is based on the content analysis method, and the data collection is from open database resources and statistical reports of competent authorities. The author also applies the desk research method.

Results: The suppression of environmental crime is not satisfactory; according to the SOCTA report, 685 environmental crimes were registered in the Republic of North Macedonia in the period 2016-2019, but this is not the real situation.

Discussion: The detection function for these crimes is low and ineffective; therefore, numerous activities are required, including forensic analyses, to prove the crime and identify the perpetrators.

Keywords: forensic, environment, crimes, analysis, etc.

TOWARDS INCLUSIVE COMMUNITY LIVING: INTEGRATING GENDER EQUALITY AND SOCIAL INCLUSION FOR WOMEN WITH MENTAL ILLNESS

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ABSTRACT

Introduction: Mental illness is a growing concern, and women with mental health conditions often face extended institutionalisation even after clinical recovery due to stigma, rejection, and lack of rehabilitation support. This undermines their right to dignity and community living as guaranteed under Article 21 of the Indian Constitution and Article 19 of the UNCRPD. This paper critically examines the post-discharge realities of such women, linking the issue to SDG 3 (Good Health and Well-being) and SDG 5 (Gender Equality).

Methods: A mixed-methods approach combining doctrinal and empirical research was adopted. Quantitative data were collected from government sources, hospital records, and NGOs. In contrast, qualitative data were obtained through interviews with staff at the Regional Mental Hospital in Thane, NGO workers, and women who remained institutionalised post-recovery.

Results: Findings indicate that many women with mental illness are denied community living post-discharge, and government efforts to establish halfway homes and community-based facilities remain inadequate. Extended hospital stays are influenced by resource constraints, social stigma, and disrupted family relationships.

Discussion: The study recommends a time-bound deinstitutionalisation policy, expansion of halfway homes, and a rights-based, gender-sensitive rehabilitation framework. Addressing the post-discharge needs of this vulnerable group is essential for achieving SDG 3 and SDG 5.

Keywords: community living, deinstitutionalisation, halfway home, rights-based, gender sensitive

MEASURING AND MOBILIZING EDUCATION FOR EQUITY AND SUSTAINABILITY

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ABSTRACT

Introduction: Education is a powerful instrument for fostering a more equitable and sustainable world. However, despite global progress, many individuals, particularly those from marginalized communities, still encounter barriers to quality education. This study examines how education systems can be better measured, supported, and transformed to advance equity and sustainability.

Methods: The present study employs a mixed-methods approach, integrating qualitative and quantitative data. Surveys, interviews, and analyses of demographic data were conducted to assess educational equity across various contexts. Equity indices and case studies were utilized to evaluate how countries and institutions are tracking and addressing disparities.

Results: This paper asserts that, although numerous governments and organizations are making concerted efforts to advance educational equity, significant disparities persist, particularly along socioeconomic status, gender, and ethnic lines. Data-driven strategies are essential for clearly identifying challenges and facilitating prompt, effective policy responses.

Discussion: The discussion emphasizes the critical importance of accurately quantifying equity and leveraging that data to facilitate significant and constructive change. When integrated with innovation and inclusive practices, education serves as a potent catalyst for fostering sustainability and advancing social justice.

Keywords: Equity, sustainability, inclusive education, educational technology, data-driven policy

CORRELATION BETWEEN FUNCTIONAL ABILITY AND FALL RISK AMONG INSTITUTIONALIZED ELDERLY RESIDENTS

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Introduction: Aging is characterized by a progressive decline in physical, sensory, and cognitive functions, leading to reduced independence and increased risk of falls among elderly patients. Institutionalized older adults face additional challenges due to limited mobility, comorbidities, and decreased engagement in daily activities.

Methods: The research included 30 elderly residents from the Nursing Home in Bitola - Kravari. Functional ability was assessed using the Barthel Index of Activities of Daily Living. At the same time, fall risk was evaluated with the Tinetti Performance-Oriented Mobility Assessment and Timed Up and Go test.

Results: 63.3% of participants had moderate functional dependence according to the Barthel Index, and 46.7% had a high fall risk on the Tinetti scale. A significant negative correlation was observed between functional ability and fall risk, indicating that lower independence was associated with greater fall probability.

Discussion: The results show the strong association between functional capacity and fall risk among institutionalized elderly individuals. Implementing individualized rehabilitation, balance training, and environmental modifications can substantially reduce the incidence of falls and improve quality of life.

Keywords: functional ability, fall risk, elderly, rehabilitation, nursing home, Barthel Index, Tinetti test

CURRENT QUALITY OF CROSSREF METADATA IN MACEDONIAN SCIENTIFIC JOURNALS (2025)

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ABSTRACT

Introduction: When a publisher registers a DOI with Crossref, they are also expected to submit associated metadata—structured information about the content. We aimed to analyse the current quality of Crossref Metadata in Macedonian scientific journals and to suggest mechanisms to improve it.

Methods: On February 15, 2025, an analysis was conducted using Crossref's "Participation Reports – How good is your metadata?" tool to identify publishers in the Republic of North Macedonia that deposit Crossref metadata. Altogether, 37,595 registered content items from these Macedonian publishers were included in the evaluation.

Results: The 2025 analysis of Crossref metadata in Macedonian scientific journals shows limited participation, with only 37 out of around 140 publishers represented. A few key institutions lead DOI deposits, but reference, ORCID iD, affiliation, funding, and Crossmark metadata are largely missing.

Discussion: Current Crossref metadata quality in Macedonian scientific journals is very low. Most Macedonian scientific journals do not use Crossref metadata services.

Keywords: Crossref metadata, scientific journals, Macedonia

ACHIEVEMENTS TOWARDS SDG4: REVIEW

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ABSTRACT

Introduction: As the Sustainable Development Goals enter the final third of the 2030 Agenda journey, there is a need for a comprehensive review and critical reflection on how SDG 4 (quality education) in higher education has been developed from an academic research perspective.

Methods: This study explores achievements related to SDG4 through a comprehensive review guided by the PRISMA approach and qualitative analysis of articles published in the ten leading journals between 1990 and 2025.

Results: The thematic analysis revealed four key areas in the SDG4 research process in higher education: sustainability in the curricula, competence for sustainability, implementation of digital technologies, and the symbiosis of SDG4 with other SDGs.

Discussion: The identified clusters help advance the field, enrich conversation around sustainable university practices, and provide practical insights for higher education leaders and policymakers. The study concludes that enhancing scientific output through more targeted, in-depth knowledge is essential to drive global progress on SDG4.

Keywords: SDGs, SDG4, quality education, education for sustainability

DIGITAL TECHNOLOGIES IN PUBLIC ADMINISTRATION: A CASE STUDY OF ESTONIA'S E-GOVERNANCE FOR INCLUSIVE AND SUSTAINABLE DEVELOPMENT

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ABSTRACT

Introduction: In today's world, increasingly marked by inequality, climate change, and governance challenges, the United Nations Sustainable Development Goals (UN SDGs) underscore the need to foster inclusive and sustainable societies. Digital technologies provide a critical avenue for realizing these objectives, and Estonia, a small Baltic nation, stands as an exemplary global example of this potential.

Methods: This qualitative case study uses a narrative approach to explore how the Estonian national government used digital technology to transform public administration across education, taxation, and justice, to foster inclusive and sustainable societies, drawing on peer-reviewed studies, government records, and industry reports. The study also underscores the nation's steadfast commitment to safeguarding privacy and cybersecurity, while highlighting the scaling and sustainability challenges it currently faces.

Results and Discussion: The findings of the study indicate that Estonia's e-governance, facilitated by digital technologies and characterized by e-voting, e-education, e-health, e-ID, e-residency, e-business tools, e-justice, and a data embassy, has enhanced public engagement, reduced operational expenses, and mitigated environmental impacts. These results highlight how a government driven by digital technology is guiding the nation towards greater inclusivity and sustainability. Additionally, it emphasizes that inter-sectoral collaboration and strategic approaches to improve cyber resilience are crucial to the success of e-governance and ultimately to the establishment of inclusive and sustainable societies. The study concludes that Estonia's e-governance has helped establish inclusive and sustainable societies and furthered equitable and sustainable development in accordance with the United Nations Sustainable Development Goals, including SDG 9 (Industry, Innovation and Infrastructure), SDG 10 (Reduced Inequalities), and SDG 16 (Peace, Justice and Strong Institutions). It underscores that equitable practices, strong intersectoral collaboration, and strategic and proactive governance are crucial for enabling technology-driven public administration.

Originality and Value: Building inclusive and sustainable societies is increasingly significant in today's world, where governments are seeking governance frameworks that are transparent, effective, and people-oriented. This study offers policymakers and strategists in other nations much-needed guidance on leveraging digital technologies to improve public administration and build inclusive and sustainable societies.

Keywords: digital governance, inclusive development, public administration, sustainable development, strategic governance

ADOLESCENT IDIOPATHIC SCOLIOSIS IN HIGH SCHOOL YOUTH IN MACEDONIA AND PUBLIC HEALTH

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ABSTRACT

Introduction: Idiopathic scoliosis is a three-dimensional deformity of the spine with an unknown aetiology. Adolescent idiopathic scoliosis is a common disease with an overall prevalence of 0.47–5.2% in the current literature. The female-to-male ratio ranges from 1.5:1 to 3:1 and increases substantially with age.

Methods: Descriptive study of the incident type, which includes 690 children of secondary school age from 15 to 18 years, with a clinical diagnosis of scoliosis, with the goal of radiological confirmation of the condition.

Results: From the statistical analysis of a total of 690 respondents, spinal deviation was present in all 690 respondents. The mild form of scoliosis was most common, present in 89.1% of respondents, followed by a moderate degree in 7.9%, while the severe form was found in 3%. Scoliosis is more prevalent in female children (65.8%) compared to male children.

Discussion: A multidisciplinary and multisectoral approach is fundamental, including not only health workers and the education sector as a whole, but also the entire community, which should actively participate in implementing health promotion.

Keywords: adolescent idiopathic scoliosis, high school youth, radiology, screening, multidisciplinary approach

COMPARATIVE ANALYSIS OF ROTIFER COMMUNITIES IN NATURAL LAKES AND RESERVOIRS OF NORTH MACEDONIA

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ABSTRACT

Introduction: Rotifers are widely recognized as effective bioindicators of freshwater ecosystems due to their sensitivity to environmental changes, rapid life cycles, and their central role in aquatic food webs. This study compares rotifer assemblages in natural lakes and reservoirs of North Macedonia, focusing on community structure, diversity, and responses to environmental drivers.

Methods: The analysis is based on findings from published studies and long-term monitoring programs in Macedonian freshwater ecosystems. Rotifer communities were evaluated for species richness, abundance, and functional feeding groups. Environmental parameters were considered in relation to rotifer dynamics.

Results: Natural lakes supported higher rotifer diversity and more stable assemblages, often dominated by species adapted to oligotrophic and mesotrophic conditions. In contrast, reservoirs exhibited lower species richness and greater abundance fluctuations, with opportunistic taxa prevailing under nutrient-enriched conditions.

Discussion: Rotifer communities in natural lakes are structured by long-term ecological stability, whereas reservoir communities are shaped by nutrient loading and hydrological instability. These differences highlight the role of rotifers as sensitive indicators of eutrophication and disturbance.

Keywords: rotifers, lakes, reservoirs, community structure, bioindicators

THE GREEN TRANSITION AS A DRIVER OF THE SUSTAINABLE DEVELOPMENT: THE EVIDENCE FROM NORTH MACEDONIA

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ABSTRACT

Introduction: The current energy crisis, accompanied by rapid climate change and resource depletion, has posed challenges for governments and businesses. The green transition has been globally transforming the structure of production and consumption towards less-polluting, more resource-efficient economies.

Methods: This paper aims to assess the green transition in North Macedonia as a driver of sustainable development. The empirical analysis is based on an employer survey of a representative sample of 530 companies in North Macedonia, conducted in March 2025.

Results: About 60 percent of the surveyed companies apply one or more green practices, while the remaining 40 percent report not having any green practices. Companies that apply green practices have statistically significant increases in both specific sectoral and cross-sectoral green skills mismatches.

Discussion: The findings highlight a dual challenge: bridging qualification gaps and realigning training systems to cover emerging green occupational fields. Policy measures should include modular upskilling programs and industry-academia collaboration.

Keywords: Green transition, green jobs, green skills, sustainable development

INCORPORATING BIOPHILIA: A CASE STUDY OF CHRIST UNIVERSITY PUNE LAVASA CAMPUS

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ABSTRACT

Introduction: The present case study explores how biophilic design elements are integrated in Christ University Pune Lavasa campus, a hill-town institution known for its eco-conscious infrastructure and scenic setting.

Methods: The research focuses on documenting various nature-integrated features through relevant theoretical frameworks, including the Biophilia Hypothesis and Attention Restoration Theory, and on drawing on Indian Knowledge Systems.

Results: The study examines natural lighting, green spaces, water bodies, and spatial orientation of built structures in relation to the surrounding landscape, positioning biophilic design as both culturally rooted and forward-looking.

Discussion: By linking traditional insights with modern design principles, the study contributes to multidisciplinary conversations around Sustainable Development Goals 3, 4, and 11, strengthening the need to reimagine educational spaces as ecosystems that support holistic well-being.

Keywords: Biophilic design, Indian Knowledge Systems, sustainable development, nature-integrated education, campus design

STUDENT ENGAGEMENT PATTERNS IN ASYNCHRONOUS PROJECT MANAGEMENT COURSES: A LEARNING ANALYTICS APPROACH

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ABSTRACT

Introduction: This study examines student engagement patterns in the graduate course "Project Development and Management Methodology" delivered through Moodle-based e-learning to support inclusive education.

Methods: Learning analytics were applied to analyse student activity data from one academic semester, including login patterns, content interaction times and assignment submission behaviours among 34 students.

Results: Preliminary findings reveal distinct engagement clusters: early-week learners (17%), distributed learners (38%), and deadline-driven learners (45%). Higher course completion rates (91%) were observed in the e-learning course compared to traditional delivery (79%).

Discussion: The findings demonstrate that asynchronous delivery successfully accommodates students with varying personal and professional priorities without compromising learning quality. Understanding these engagement patterns helps educators better support diverse learning styles.

Keywords: asynchronous learning, project management education, inclusive education, student engagement, learning analytics

SMALL STATE'S CAPTURED SUSTAINABLE DEVELOPMENT AS A CONSEQUENCE OF INSTITUTIONAL WEAKNESS AND POLITICAL POPULISM: WESTERN BALKANS CASE STUDY

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ABSTRACT

Introduction: The purpose of this paper is to analyze the role of institutional and political frameworks as variables in the ongoing process of securing sustainable development. The authors' thesis relies on the explanation that sustainable development is directly conditioned by political and institutional frameworks in small states with limited resources. The research question examines what instruments are available to small states for securing development and sustainability.

Methods: The authors use basic analytical methods, including content analysis of literature and documents and abstraction, to highlight important characteristics that determine foreign policy actions of small states. Special attention is paid to the correlation between the Sustainable Development Agenda and foreign policy behavior. The empirical example of the Western Balkans is analyzed using concretization.

Results: Based on available data and the effectiveness of foreign policy activities, including internal political and institutional flows within Western Balkan states, the results explain why the sustainable development agenda is "captured" by institutional and political dysfunction.

Discussion: From a theoretical perspective, the authors use institutionalism to challenge the neoclassical thesis about the individual's role in decision-making. Sustainable development is a process that combines internal policies and foreign policy activism, and this interplay is essential to a comprehensive analysis of small states' development challenges.

Keywords: small states, sustainable development, institutions, weakness, policy, populism

CONSTITUTIONAL LAW, AI GOVERNANCE, AND THE SUSTAINABLE DEVELOPMENT GOALS: A LEGAL REALIST PERSPECTIVE

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ABSTRACT

Introduction: This paper examines the intersection of constitutional law, artificial intelligence (AI) governance, and the Sustainable Development Goals (SDGs), with particular emphasis on SDG 16—Peace, Justice, and Strong Institutions—as the normative anchor for accountability, equity, and access to justice. The objective is to explore how constitutional law can adapt dynamically to technological advancements while ensuring inclusivity and sustainability, in line with the broader 2030 Agenda.

Methods: The study employs a comparative legal analysis of international frameworks such as the EU AI Act and North American approaches, juxtaposed with India's evolving legal system. A legal realist lens is applied, supplemented by anticipatory governance methods, including risk forecasting, horizon scanning, and scenario building, to propose adaptive regulatory mechanisms aligned with SDG principles.

Results: Findings suggest that while developed regions have proactively embedded transparency, human rights, and accountability safeguards in AI regulation, India faces the dual challenge of promoting sustainable growth and upholding constitutional principles. The proposed creation of a dedicated AI Committee emerges as a viable mechanism for proactive governance and for embedding SDG-linked accountability in AI use.

Discussion: The study concludes that adaptive legal innovation, grounded in constitutional frameworks and explicitly aligned with the SDGs, can transform AI into a responsible enabler of equitable, transparent, and accountable societies. By integrating inclusivity, diversity, and resilience, constitutional law can ensure that technological progress supports democratic values while reinforcing the global commitment to the 2030 Agenda.

Keywords: Constitutional Law, Artificial Intelligence Governance, Sustainable Development Goals, SDG 16, Legal Realism, Anticipatory Governance, EU AI Act, India

SUSTAINABLE TOURISM DEVELOPMENT AND EXCESSIVE CONSTRUCTION

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ABSTRACT

Introduction: In the development of a tourist destination, the question of the destination's capacity and the danger of excessive construction always arises. The capacity of each tourist destination is limited, and the continuous increase in residential units can threaten its functioning and attractiveness. Around the world, destinations such as Venice, Dubrovnik, and Santorini have implemented strict measures to limit construction and restrict tourist access.

Methods: This paper analyzes the literature on destination capacity and methods for identifying overcrowding in tourism, and applies these studies to tourist destinations in North Macedonia. Data analysis includes the increase in residential units in selected destinations, with particular focus on changes in domestic tourist numbers, as they are more likely to own properties in tourist areas. The analysis examines vacancy rates of constructed apartments and their impact on domestic tourism. Statistical methods include correlation analysis, linear regression, and nonlinear methods for pattern identification and forecasting.

Results and Discussion: Ohrid, as a UNESCO-protected city, presents particular challenges for this analysis. The seasonal nature of tourism in Ohrid further complicates the calculation of carrying capacity. The results will show whether new residential construction contributes to or undermines tourism development, enabling implementation of appropriate sustainable tourism policies and residential capacity planning.

Keywords: tourism, sustainability, overcrowding, analysis

UNDERSTANDING TOURIST EMOTIONS TO FOSTER SUSTAINABLE DEVELOPMENT

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ABSTRACT

Introduction: The global emphasis on sustainable development, guided by the Sustainable Development Goals (SDGs), has increased the need for strategies that protect cultural and natural resources, especially in tourism. This study addressed the challenge of integrating sustainable tourism with innovative management practices by analyzing tourists' sentiments toward the Monastery of Saint Naum, the most visited attraction in the Lake Ohrid Region of North Macedonia.

Methods: Sentiment analysis of TripAdvisor reviews collected through August 2025 to assess visitor experiences and perceptions.

Results: Results showed predominantly positive sentiments focused on admiration for the site's natural beauty, historical and spiritual significance, and enjoyment of leisure activities such as boat rides and local dining. Negative feedback mainly focused on crowding and long queues, which slightly reduced visitor satisfaction.

Discussion: The study concluded that sustainable tourism management strategies should balance visitor access with conservation efforts, including controlling peak-time visits, investing in preserving the monastery's architectural heritage and natural surroundings, and promoting eco-friendly transport. Supporting local businesses within the monastery compound was also recommended to enhance visitor services and community benefits. These findings provide practical guidance for tourism managers, emphasizing the importance of understanding tourist emotions and aligning development with sustainability goals to safeguard the site's cultural and environmental integrity for the future.

Keywords: Sustainable Tourism, Sentiment Analysis, Visitor Experience, Tourism Development, Ohrid, North Macedonia

ACCESS TO JUSTICE IN ENVIRONMENTAL MATTERS: A COMPARATIVE STUDY OF INDIA AND THE EUROPEAN UNION

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ABSTRACT

Introduction: In environmental governance, access to justice plays a crucial role in ensuring accountability, public participation, and the protection of rights. Both India and the European Union have developed legal systems to uphold environmental justice, but they do so within distinct legal, cultural, and constitutional frameworks. This study examines the similarities, differences, and lessons that can be drawn from the judicial systems of India and the EU to improve access to environmental justice.

Methods: The study employs comparative legal analysis, drawing on international instruments, constitutional provisions, and judicial decisions. It analyzes the jurisprudence of the Supreme Court of India and the National Green Tribunal (NGT) alongside decisions of the European Court of Justice (ECJ) and domestic courts of EU member states.

Results: The Indian judiciary has interpreted the right to a healthy environment broadly under Article 21 of the Constitution, thereby expanding access to justice through Public Interest Litigations (PILs). The establishment of the NGT has further institutionalized the adjudication of environmental disputes. In contrast, the Aarhus Convention ensures that individuals and NGOs in Europe can challenge environmental decisions, though practical barriers, such as litigation costs and standing requirements, limit access in several member states.

Discussion: While both jurisdictions affirm the right of access to environmental justice, their approaches differ significantly. The EU framework emphasizes procedural safeguards and adherence to international standards, whereas India relies more heavily on fundamental rights and judicial innovation. These models illustrate complementary pathways toward strengthening environmental justice: one grounded in institutional precision, and the other in constitutional dynamism.

Keywords: Environmental Justice, Public Interest Litigation (PIL), Access to Justice, Aarhus Convention, National Green Tribunal (NGT)

SPATIAL PATTERNS AND INSTITUTIONAL DIVERSITY IN EUROPEAN UNIVERSITY ALLIANCES: A QUANTITATIVE PERSPECTIVE

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ABSTRACT

Introduction: European University Alliances are a key initiative to foster cooperation, integration, and competitiveness within the European Higher Education area. While much attention has been given to policy and governance, less attention has been paid to spatial and institutional characteristics. The number of universities and other higher education institutions within each alliance, along with their geographic distribution, strongly influences collaboration potential, resource allocation, and institutional balance. However, systematic quantitative evidence remains scarce. This study addresses the gap by analyzing the geographic dispersion patterns and institutional diversity of alliances, focusing on alliances' geo-centroid longitude and latitude, European countries and regions that host alliances' geo-centroids, as well as two novel indices introduced during the research: the Geographic Dispersion Index (GDI) and the Institutional Diversity Index (IDI).

Methods: Data on alliance members and alliances were collected separately from alliance websites, institutional websites and databases, and European reports. A quantitative design was applied, based on a series of statistical analyses, including descriptive statistics, correlation analysis, hierarchical clustering, and multiple linear regression modeling.

Results: Geo-centroid analysis showed a strong concentration in Central Europe, particularly Germany, while Southern and especially Southeastern Europe remain underrepresented, highlighting a core-periphery divide in the spatial integration of the European Higher Education Area. Although geographic dispersion (GDI) varies substantially, with Western alliances being the most transnational and Southern ones the most compact, institutional diversity (IDI) remains low and uneven, suggesting that alliances tend to form among similar institution types rather than across complementary profiles. The weak, non-significant correlation between GDI and IDI confirms that spatial and institutional dimensions operate independently. Regression results further indicate that western and southern alliances are more geographically spread, while northern and eastern ones are spatially cohesive, yet these locational factors do not significantly affect institutional diversity. Cluster analysis reinforces these findings, revealing diverse spatial-institutional configurations but no systematic link between geographic dispersion and institutional diversity.

Discussion: The results collectively reveal a pronounced spatial imbalance in the distribution and composition of European University Alliances. From a policy perspective, the obtained outcomes highlight the need for differentiated, region-sensitive support: promoting broader participation from peripheral European regions, addressing spatial inequalities, and incentivizing institutional heterogeneity to strengthen the inclusiveness, balance, and transformative potential of the European Universities Initiative.

Keywords: European university alliances, geographic dispersion index, institutional diversity index, descriptive statistics, correlation analysis, hierarchical clustering, linear regression

EQUALITY IN INTERNATIONAL LAW AND THE LEGAL ORDER OF NORTH MACEDONIA WITHIN THE SDGs FRAMEWORK

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ABSTRACT

Introduction: The principle of equality is a cornerstone of the rule of law and a prerequisite for safeguarding human rights. This research investigates the extent to which the legal order of the Republic of North Macedonia aligns with international standards on equality and non-discrimination.

Methods: A mixed-methodological approach was applied, combining normative-legal analysis, the comparative-legal method, and doctrinal interpretation. The analysis covered key international legal instruments (Universal Declaration of Human Rights, CEDAW, European Convention on Human Rights, Istanbul Convention) in correlation with national legal acts (Constitution of the Republic of North Macedonia, Law on Prevention and Protection against Discrimination, Law on Equal Opportunities for Women and Men) during the period 2010–2023.

Results: The normative-legal analysis indicates a high level of formal harmonization between national legislation and international equality standards. However, the empirical evaluation highlights a considerable implementation gap. Despite the sophistication of the de jure framework, practical enforcement remains limited due to systemic shortcomings.

Discussion: The study reveals a paradox between normative compliance and practical effectiveness. Structural constraints within the judiciary, insufficient institutional resources, lack of systematic monitoring, and inconsistent application of international obligations undermine adequate protection against discrimination. Bridging this gap requires transforming formal commitments into operational mechanisms to ensure genuine compliance with international equality standards and substantive human rights protection.

Keywords: Equality; Non-discrimination; International standards; Legal harmonization; Implementation gap

MICROBIOLOGICAL RESEARCH OF LAKE PRESPA

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ABSTRACT

Introduction: Lake Prespa, affected by natural and anthropogenic factors, has manifested changes in basin morphometry and accelerated eutrophication during recent decades. This investigation aimed to determine the composition and dynamics of microbial communities, water quality, and anthropogenic influence on the trophic state of Lake Prespa from summer 2024 to spring 2025.

Methods: Standard limnological methods were used to identify heterotrophic, proteolytic, amylolytic, lipolytic, and phosphomineralizing bacteria, and to determine total numbers of coliforms, E. coli, and enterococci, as well as parameters for organic and nutrient load. The saprobic index of rotifer species and localities, based on relative species abundance, was determined according to Pantle & Buck.

Results: The data confirm known ecological phenomena involving the interactions of biotic and abiotic environmental factors that influence microbial life, dynamics, and distribution. Relatively lower values were recorded at the lake littoral site, Lisa and the central point, while the highest values for all parameters were recorded in River Golema water.

Discussion: Fecal indicator bacteria in Lake Prespa indicated slight (Class I at Lisa) to moderate and strong (Classes II, III) fecal contamination and organic pollution. River Golema was the most contaminated and classified as excessively polluted (Class V). Higher values are mainly due to anthropogenic influences, including the discharge of municipal wastewater from settlements and tourist sites. Registered rotifer species belong to water quality categories I and II, with saprobity index values (1.62-1.82) indicating oligo-ß-mesosaprobic waters. Protection measures and regular monitoring are necessary to prevent further eutrophication.

Keywords: bacteria, rotifera, water quality, pollution, organic matter, nutrients

PROTECTING PERSONAL DATA IN THE DIGITAL AGE - LEGAL CHALLENGES AND EMERGING OPPORTUNITIES

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ABSTRACT

Introduction: The protection of personal data has emerged as one of the most critical legal and ethical concerns in the digital age. As data increasingly functions as a core asset of the global economy, its collection, processing, and transboundary transfer raise complex challenges for privacy, security, and human rights.

Methods: The research employs observational and analytical methods to examine evolving legal frameworks governing personal data protection, with particular attention to the interplay between international standards (notably GDPR) and their divergent applications across jurisdictions. It analyzes gaps, ambiguities, enforcement challenges, and tensions between privacy rights, state security imperatives, and corporate interests.

Results: The study identifies persistent challenges in data protection regulation and underscores the urgent need for coherent and resilient regulatory responses to address large-scale data breaches and cyberattacks.

Discussion: Beyond highlighting challenges, the presentation considers potential pathways forward through properly designed legal mechanisms combined with responsible technological innovation to strengthen transparency, accountability, and trust. Safeguarding personal data represents a cornerstone of sustainable digital development and societal trust in emerging technologies.

Keywords: Personal Data Protection, Privacy Law, Cybersecurity

THREE DECADES IN THE COUNCIL OF EUROPE: NORTH MACEDONIA'S PATH TO DEMOCRATIC RESILIENCE AND INSTITUTIONAL REFORM

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ABSTRACT

Introduction: In 2025, North Macedonia marks 30 years of membership in the Council of Europe, offering a critical opportunity to evaluate the country's democratic resilience and institutional reforms within the UN Sustainable Development Goals framework.

Methods: The study employs longitudinal analysis of key legal reforms, monitoring reports, and institutional case studies, with particular attention to the role of the Venice Commission and European Court of Human Rights in guiding domestic reform trajectories.

Results: Findings demonstrate notable progress in strengthening judicial frameworks and aligning electoral processes with European standards, while persistent political polarization, insufficient transparency, and fluctuating public confidence remain critical obstacles.

Discussion: North Macedonia's trajectory illustrates both the potential and limits of international frameworks in advancing democratic transformation in transitional contexts, underscoring the importance of sustained international partnerships alongside consistent domestic political will for achieving durable institutional resilience.

Keywords: North Macedonia, Council of Europe, transitional democracy, institutional reforms, rule of law, public trust, Sustainable Development Goals

CLIMATE CHANGE AND ITS IMPACT ON THE KRIVOLAK MILITARY TRAINING AREA IN THE 21ST CENTURY: CHALLENGES, ADAPTATION, AND THE ROLE OF SMART MILITARY TECHNOLOGIES

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ABSTRACT

Introduction: Climate change poses increasing challenges to military infrastructure, especially in regions prone to extreme weather and environmental change. This paper examines how climate change is affecting the Krivolak Military Training Area in North Macedonia.

Methods: The study integrates environmental data, military doctrine, and emerging technologies to explore how this vital training site is being reshaped in terms of terrain usability, training readiness, and logistical planning, using scenario-based assessment with visualized results.

Results: The analysis demonstrates operational consequences of climate change and identifies how smart technologies can improve resilience.

Discussion: Findings underscore a broader need to integrate climate awareness and technological adaptation into military planning and infrastructure design, leveraging geospatial monitoring, predictive modeling, and adaptive training systems to enhance military readiness.

Keywords: Krivolak training area, climate resilience, military readiness, technological adaptation, North Macedonia

CONTEMPORARY TRENDS IN THE EU ENLARGEMENT PROCESS

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ABSTRACT

Introduction: The European Union functions as a complex multi-structural political entity, with integration, particularly enlargement, at its core.

Methods: This paper applies a qualitative, analytical approach using comparative analysis of past enlargements, EU documentation, and relevant academic sources to study contemporary EU enlargement processes.

Results: Following the enlargement waves of 2004, 2007, and 2013, the EU shifted its focus to Western Balkan states with institutional weaknesses and unresolved issues. Recent applications from Ukraine, Moldova, Georgia, and Armenia, encouraged by geopolitical repercussions of the war in Ukraine, have altered enlargement dynamics.

Discussion: Candidate countries face complex political, economic, and security challenges in meeting accession criteria, while EU instruments continue to shape their reforms. Enlargement remains a transformative yet contested process requiring a balance between geopolitical urgency and adherence to accession standards.

Keywords: EU Enlargement, EU Enlargement criteria, EU Enlargement process, global and internal influences on EU accession process, EU contribution towards development of accession process

NORMATIVE–LEGAL ANALYSIS OF THE PROTOCOL OF COOPERATION BETWEEN THE PUBLIC PROSECUTOR'S OFFICE AND THE MINISTRY OF INTERIOR OF THE REPUBLIC OF NORTH MACEDONIA

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ABSTRACT

Introduction: This paper provides a legal analysis of the provisions contained in the recently adopted Protocol of Cooperation between the Ministry of Interior (MoI) and the Public Prosecutor's Office of the Republic of North Macedonia (PPO) within the framework of criminal procedure.

Methods: The paper conducts a comprehensive legal analysis of the Protocol's provisions and examines specific internal legal acts established between the two institutions.

Results: The analysis demonstrated that the Protocol contains certain ambiguities in the legislative text that need to be more precisely defined.

Discussion: By adopting the new Protocol and taking into account the challenges faced over the past two years, both institutions have taken a substantial step towards overcoming divergences in their joint actions, with the overarching aim of ensuring that justice in the Republic of North Macedonia is administered at the highest possible standard.

Keywords: Protocol, cooperation, criminal procedure, institutions

KEY ROLE OF LANGUAGES IN THE FIELD OF EDUCATION AND CULTURAL IDENTITY

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ABSTRACT

Introduction: This paper aims to reaffirm the essential understanding that the use of mother tongues is crucial for cultural heritage, education, and the creation of inclusive societies. The importance of languages lies in their capacity to nurture cultural identity, foster understanding among peoples, and address the growing challenges of preserving linguistic diversity.

Methods: The research applies a qualitative and comparative approach, analyzing linguistic theories and models by Jakobson, Saussure, Lévi-Strauss, Misirkov, and Koneski. Through a theoretical and contextual examination, the paper explores the relationship among language, education, and national identity, focusing on the Macedonian language as a case study.

Results: Findings highlight that linguistic diversity and the preservation of mother tongues are crucial for sustaining cultural identity and promoting inclusive education. The study confirms that language policies supporting multilingual education directly contribute to social cohesion and intergenerational learning. Statistical data show that around 6,500 languages are spoken today, but nearly half are endangered, underlining the urgent need for global action.

Discussion: The results emphasize the need for continuous global efforts to protect linguistic diversity as a foundation for cultural sustainability. The example of the Macedonian language illustrates how national identity and cultural continuity can be strengthened through multilingual and inclusive education. The paper concludes with recommendations for educational frameworks that promote the preservation and advancement of linguistic and cultural heritage in the context of globalization.

Keywords: mother tongue, linguistic diversity, sustainability, cultural heritage, education

FRESHWATER MACROINVERTEBRATE COMMUNITIES AS BIOLOGICAL QUALITY ELEMENT (BQE) IN SEMI-MOUNTAINOUS AND MOUNTAINOUS RIVERS IN BALKANS - ANTHROPOGENIC ACTIONS AND CLIMATE CHALLENGES

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ABSTRACT

Introduction: Semi-mountainous and mountainous rivers are important sources of water, sediments, and biota for downstream reaches, and they play an important role in maintaining regional biodiversity in river ecosystems. For over a century, freshwater macroinvertebrates have been used as key indicators, with their community structure reflecting environmental conditions. This study aims to discuss the ecological status of such "reference watercourses" based on present aquatic macroinvertebrate communities.

Methods: In this study, the macroinvertebrate dataset from the Struma, Mesta, Vardar, and Drim river watersheds, collected during various monitoring campaigns (2010-2022), was used. The specimens were collected with a hydrobiological hand net (mesh size 500 μm) using the kick-and-sweep multihabitat procedure.

Results: Overall, insects (>70%) predominate in semi-mountainous and mountainous rivers. Therefore, the diversity and abundance of Ephemeroptera, Plecoptera and Trichoptera, as the most sensitive groups/taxons were discussed. Most studied rivers do not achieve good ecological status due to hydromorphological habitat degradation and/or organic/anthropogenic pollution.

Discussion: Gained results contribute to knowledge of the current ecological state of some rivers in a poorly studied area and assist in selecting appropriate metrics for water-quality assessment based on macroinvertebrates as BQE. Long-term negative pressure and ongoing climate change have led to the loss of microhabitats, affecting the structure and functioning of aquatic ecosystems by transforming macroinvertebrate communities.

Keywords: Aquatic ecosystems, ecological status, macrozoobenthos, ecology, biodiversity

ARCHAEOLOGICAL HERITAGE, CULTURAL DIPLOMACY AND THE SUSTAINABLE DEVELOPMENT OF INTERNATIONAL RELATIONS

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ABSTRACT

Introduction: This paper critically reevaluates the role of cultural diplomacy in 21st-century international relations. This study aims to explore a novel methodological approach by examining the intersection of archaeological heritage and cultural diplomacy to foster sustainable development in global affairs.

Methods: The research employs a qualitative analysis of existing literature and specific case studies in the field of heritage diplomacy. It examines the mechanisms through which archaeological sites, artefacts, and cultural narratives are integrated into diplomatic strategies to promote intercultural dialogue and sustainable practices.

Results: The analysis demonstrates that archaeological heritage functions as a crucial component of the "software" of modern societies. The findings indicate its significant potential as a soft power tool to enhance international relations by contributing to peacebuilding, preserving cultural diversity, stimulating responsible tourism, and supporting economic growth through heritage preservation.

Discussion: The study concludes that integrating archaeological heritage with cultural diplomacy strategies offers a powerful means to advance Sustainable Development Goals while strengthening political and economic ties. The results underscore the broader applicability of heritage diplomacy in global peace and cooperation efforts.

Keywords: Cultural Diplomacy, Archaeological Heritage, Interdisciplinarity, Sustainable Development, International Relations

FEATURES OF THE WORK OF A TUTOR EDUCATOR WITH CHILDREN WITH AUTISM SPECTRUM DISORDERS

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ABSTRACT

Introduction: This scientific study is devoted to analysing the problem of organising inclusive education in preschool institutions, particularly in conditions of martial law. The author examines the peculiarities of organising the work of a tutor educator when working with children with autism spectrum disorders who have experienced military action.

Methods: The study analyzes and generalizes theoretical and practical achievements in the field of inclusive education in preschool institutions, focusing on a safe and inclusive educational space in conditions of martial law, the peculiarities of socialization of children with ASD, and the clarification of the functional duties of teacher's assistants in inclusive groups.

Results: The study emphasizes that the main functions of an assistant educator for children with autism spectrum disorders must be modified and adapted to the challenges of war, including distance learning, assisting with evacuations to shelters, accompanying children during emergencies, and providing pre-medical care and psychological support.

Discussion: The author assesses teaching assistants' awareness of inclusive education, evaluates their practical skills in working with children with ASD, identifies training needs, explores collaboration between teaching assistants and specialists, and assesses communication effectiveness with parents of children with ASD, offering practical recommendations for improvement.

Keywords: tutor educator, inclusive education, children with autism spectrum disorders

POLITICAL REPATRIATION OF STOLEN CULTURAL HERITAGE IN THE REPUBLIC OF MACEDONIA: CHALLENGES AND PERSPECTIVES

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ABSTRACT

Introduction: This paper examines the challenges of repatriating stolen cultural heritage in the Republic of Macedonia. While illicit trade in cultural property is a global issue, local conditions, such as historical legacies, transitional legal frameworks, and limited institutional capacity, add complexity.

Methods: The study adopts a qualitative, interpretative approach, combining historical analysis, legal exegesis, and case studies over the past 35 years. Data were drawn from secondary sources, including international treaties, domestic legislation, institutional reports, archival materials, and scholarly publications.

Results: Key factors undermining effective repatriation include institutional fragmentation and weak capacity; legal misalignment with international conventions; corruption and inefficiency; and weak cultural diplomacy and limited international cooperation. Emerging positive practices include digitization projects, regional cooperation, and civil society advocacy.

Discussion: Repatriation is not only a legal process but a symbolic act of cultural justice that reinforces historical continuity and collective identity. Future efforts should prioritize systematic documentation, legal harmonization, institutional strengthening, and cultural diplomacy, aligning with UN Sustainable Development Goals 16 and 11.

Keywords: cultural repatriation, political context, stolen heritage, international law, cultural diplomacy

MULTI-LIBERAL-EUROPE: A FREE SOCIETY THROUGH DIFFERENTIATED INTEGRATION

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ABSTRACT

Introduction: This paper examines the relationship between two major ideological traditions in the European integration process—liberalism and European federalism—and explores the potential for their synthesis into a coherent political framework.

Methods: The central research problem concerns the persistent heterogeneity among European Union (EU) member states in their capacities and preferences for deeper integration. The study employs theoretical analysis that integrates ideological inquiry with institutional examination, focusing on the provisions of the Lisbon Treaty and the instrument of enhanced cooperation as a pragmatic means of enabling differentiated integration.

Results: The findings are presented in the conceptual model of Multi-Liberal Europe, a scenario in which member states apply liberal principles and federalist stages of integration in a differentiated manner.

Discussion: This model provides a flexible, transitional mechanism for reconciling divergent national trajectories while maintaining broader momentum for integration. Although conceived as a provisional arrangement, the model aspires ultimately to contribute to the long-term vision of a Free and United Europe.

Keywords: Liberalism, Federalism, Multi-Speed Europe, Differentiated Integration, European Union

SUSTAINABLE DEVELOPMENT AT RISK: THE IMPACT OF RESOURCES DEFICITS, POVERTY AND CLIMATE-MIGRATION ON INTERNATIONAL ECONOMIC RELATIONS

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ABSTRACT

Introduction: In the contemporary world, resource deficits and their unequal distribution pose a major obstacle to sustainable development, with far-reaching implications for socio-economic progress, global stability, and international economic relations.

Methods: A mixed-methods approach was applied, combining quantitative and qualitative analyses of secondary data and international reports from UNHCR, the World Bank, and the IMF. A comparative analytical framework was used to investigate patterns of inequality, climate-induced migration, and conflicts arising from resource competition.

Results: Findings reveal a self-reinforcing cycle: poverty drives migration, migration strains limited resources, scarcity fuels conflict, and conflict worsens poverty. Over 30 million people are displaced each year by climate events, with projections of up to 143 million by 2050. Resource-dependent economies remain highly exposed to global shocks, deepening inequality.

Discussion: The research argues for integrated policies addressing SDGs 1, 6, 7, 13, and 16 to reduce poverty, ensure equitable resource management, and mitigate conflict. Future research should prioritize region-specific strategies that strengthen resilience and promote international cooperation.

Keywords: sustainable development, resource deficit, socio-economic inequality, climate migration, conflict, international economic relations

INSTITUTIONAL INTEGRITY AND THE RULE OF LAW AS FOUNDATIONS FOR INCLUSIVE SOCIETAL PROGRESS

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ABSTRACT

Introduction: Institutional integrity and the rule of law are essential foundations for building resilient and inclusive societies. Weak governance structures and inconsistent application of legal frameworks often undermine public trust and hinder equitable development.

Methods: The research employs a normative and analytical methodology, drawing on a systematic review of legal frameworks, institutional practices, and comparative insights from European governance models. Secondary sources, including academic literature, institutional reports, and policy documents, were examined.

Results: The findings suggest that societies with robust mechanisms of institutional integrity and consistent enforcement of the rule of law exhibit greater public trust, enhanced governance effectiveness, and stronger capacities for long-term stability.

Discussion: The results underscore that reinforcing institutional integrity and strengthening the rule of law are not only legal imperatives but also practical pathways to achieving inclusive societal progress. The discussion connects the findings to broader policy implications, emphasizing the need for institutional reforms that foster transparency, accountability, and citizen participation.

Keywords: integrity, governance, law, inclusion, sustainability

THE SOUTH CAUCASUS REGION: EXISTING THREATS AND CHALLENGES

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ABSTRACT

Introduction: The South Caucasus region is of multifaceted importance for the contemporary world. The aim of the paper is, based on Sustainable Development Goals (#16, #17), to analyze the possibility of achieving peace, justice, institutions, and partnership at the regional level.

Methods: The paper employs qualitative research methods, including historical analysis, comparative methods, case study, and descriptive methods to address the scientific problem.

Results: The paper focuses on the prospects for regional integration in the South Caucasus and the interests of major political actors in the region, which influence the development of peace, justice, partnership, and stability.

Discussion: Based on the research, it is confirmed that greater cooperation among the South Caucasus countries will be required to ensure peace and justice and counter threats. Sustainable Development Goals can be achieved only through partnership.

Keywords: Politics, sustainable development, partnership, South Caucasus, security

GLOBAL TRANSFORMATION OF THE WORLD AND WOW PARADIGMS TO MANAGE PANDEMIC AND VIRAL INFECTIONS

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ABSTRACT

Introduction: The 21st century is a transitional era, in which global transformation is manifested not only in the technological but also in the economic and social spheres. The rapidly changing epidemiological situation requires new, innovative approaches - "WOW paradigms" - in managing pandemics, viruses and infections.

Methods: The study examines WOW economic paradigms—a new-generation model that combines the principles of Well-being, Opportunity, and Wealth, integrating digital reality and sustainable development priorities.

Results: The WOW paradigm is based on three main directions: Well-being (human health, ecological sustainability and social equality), Opportunity (inclusive economic growth, access to education and technological opportunities), and Wealth (financial sustainability and fair resource distribution).

Discussion: "World Transformation and WOW Economic Paradigms" articulates a path in which progress is determined not only by economic growth but also by social integrity, ecological safety, and the humanistic use of innovation, laying the foundation for an economy that serves people.

Keywords: Paradigms, Pandemic, WHO, Healthcare, Transformation

ALGORITHMIC BIAS AND SDG EQUITY: ISSUES WITH REPRESENTATION IN AI OUTPUTS

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ABSTRACT

Introduction: AI is now everywhere, shaping how we search, write, and create images. This study investigates gender stereotypes in the image outputs of five leading generative AI platforms: Grok, Gemini, ChatGPT (DALL•E), DeepSeek, and Midjourney.

Methods: Using a small set of prompts focusing on occupations, this qualitative research examines whether AI systems reproduce or challenge existing societal biases.

Results: Initial findings indicate that generated images frequently reflect traditional gender norms: high-status roles are predominantly depicted as male, while service-oriented or care-related roles are more often portrayed as female.

Discussion: These results suggest that AI models, trained on large-scale human data, tend to mimic rather than mitigate human gender bias, posing challenges for Sustainable Development Goals 5 (Gender Equality) and 10 (Reduced Inequalities).

Keywords: Artificial Intelligence (AI), ChatGPT, Pedagogical Stylistics, AI in Education

AI IN LITERATURE TEACHING: EXPLORING THE TRANSFORMATIVE POTENTIAL OF COMMERCIAL AI MODELS IN THE LANGUAGE CLASSROOM

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ABSTRACT

Introduction: Artificial intelligence (AI) has completely transformed our world, fundamentally changing many areas of our daily lives. While natural language processing (NLP) technologies have become part of our day-to-day lives, one of the sectors most significantly affected appears to be education. However, one area that remains underexplored is AI in pedagogical stylistics—i.e., the practical use of AI models in teaching literature within the English language classroom.

Methods: Recognizing a research gap, this qualitative paper explores how teachers can incorporate AI into pre-, during-, and post-reading activities. Drawing on existing literature and personal experiences with AI use, the study proposes practical applications and activity designs, with a focus on instructional integration of AI.

Results: The paper proposes a series of practical AI-based activities designed to strengthen students' EFL (English as a Foreign Language) skills while leveraging the immense potential of these technologies in language and literature education.

Discussion: By addressing the gap in AI's role in pedagogical stylistics, the paper emphasizes AI's potential to improve engagement, comprehension, and critical thinking in literature-based EFL instruction.

Keywords: Artificial Intelligence (AI), ChatGPT, Pedagogical Stylistics, AI in Education

ECOLOGICAL STATUS ASSESSMENT OF LAKE PRESPA BASED ON THE MACROZOOBENTHOS FAUNA

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ABSTRACT

Introduction: Lake Prespa, a transboundary freshwater ecosystem of high ecological value, is increasingly affected by anthropogenic pressures and fluctuating water levels. This study assesses the ecological status of its littoral zone (North Macedonian side) based on the composition, diversity and distribution of macrozoobenthic communities.

Methods: Sampling was carried out in autumn 2022 at three sites: Oteshevo, Nakolec, and Krani. The research was conducted using standard limnological methods and in accordance with the EU Directive. Samples were collected using a van Ven grab (225 cm^2) at various depths and habitats, using vertical transects extending to the limit of macrophytic vegetation.

Results: A total of eleven species from seven systematic groups were registered. Nakolec and Krani recorded higher diversity (8 species each), while Oteshevo had only 5. Macrozoobenthos density ranged from 1250 ind/m^2 (Oteshevo) to 3250 ind/m^2 (Nakolec), with Dreissena carinata peaking at 1875 ind/m^2 at 2 m depth in Nakolec. A clear decline in biodiversity with depth was observed.

Discussion: The results indicate that invertebrate biodiversity decreases with depth, likely due to increasing sediment uniformity and greater stability of environmental factors with depth. Continued monitoring is recommended for long-term ecological assessment.

Keywords: macrozoobenthos, biodiversity, ecological status, Lake Prespa, anthropogenic impact

FOOD SYSTEMS TRANSFORMATION TOWARDS SUSTAINABILITY AND HEALTHIER GLOBAL NUTRITION

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ABSTRACT

Introduction: The global food system significantly contributes to environmental degradation, with approximately 30% of global greenhouse gas emissions originating from food production. This review addresses the urgent need to transition toward sustainable food systems that can support both human and planetary health.

Methods: The methodological approach consisted of a comprehensive literature review, analyzing current research, reports, and policy documents to assess the effectiveness of interventions in improving nutrition and reducing environmental impact.

Results: Findings highlight the critical role of sustainable food systems in addressing the double burden of malnutrition—where undernutrition and obesity coexist—and in preventing non-communicable diseases. The evidence indicates that improving food availability, affordability, and quality through coordinated actions can significantly improve health outcomes.

Discussion: This review underscores the importance of systemic change in food production and consumption patterns. It concludes that equitable access to nutritious food, combined with education and innovation in food production, is essential to achieving the United Nations' Sustainable Development Goals.

Keywords: Food system, Functional food, Food reformulation, Stakeholders, Malnutrition

PESTICIDE EXPOSURE, RISK ASSESSMENT AND FOOD SAFETY: A CASE STUDY

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ABSTRACT

Introduction: The risk assessment of pesticide residues in food plays a significant role in the field of food safety. In line with global sustainability goals for the production of safe food, the assessments provide an opportunity to quantify pesticide residues and food consumption patterns, assess the risk of pesticide exposure, and predict possible health effects.

Methods: In this paper, pesticides were analyzed by ultra-performance liquid chromatography-triple quadrupole mass spectrometry (UPLC-TQ/MS). The extraction was performed using the QuEChERS method. Risk assessment in this case study was conducted using EDI, ESTI, aHI, and cHI, applying different food consumption patterns in children and adults.

Results: This study shows that, with long- and short-term exposure to pesticides in the considered diet model, there is no risk to consumer health, but children remain more sensitive.

Discussion: The risk assessment system needs to be adapted to the characteristics of the local population and diet. It is necessary to create a national database on food consumption, which will be of great significance for assessing risks, not only from pesticides but also from other contaminants. This database will provide a point estimate of food consumption, enabling the assessment of reducing nutritional deficiencies and meeting global goals to contribute to a healthy population.

Keywords: pesticide exposure; pesticide risk assessment, nutrition, food, apples

OFF-LABEL USE OF HUMAN DRUGS IN VETERINARY SMALL PRACTICE IN THE REPUBLIC OF NORTH MACEDONIA

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ABSTRACT

Introduction: "Off-label use" is defined as the use of a medicinal product that is not in accordance with the summary of the product characteristics. This is a widespread practice in veterinary medicine, especially the "off-label use" of human-approved drugs for the treatment of small animals.

Methods: Data were collected from a private veterinary practice in North Macedonia. Veterinarians were asked to collect data on every off-label prescription or application of human drugs during 3 months. Data was categorized by animal species (dogs and cats) and drug classes.

Results: In both cats and dogs, oral antibacterial drugs were the most prescribed drugs, and oral application of amoksiklav was most commonly used in both species. Another class of off-label drugs used in dogs was gastrointestinal drugs, hepatoprotective, prokinetic agents, cardiac drugs and diuretics.

Discussion: The reasons why veterinarians frequently use "off-label" drugs from human medicine may differ: low price, no medicines available for the treatment of a specific condition, or a more suitable drug formulation. The main concern with off-label use of human drugs in veterinary medicine is the risk to public health, especially the potential impacts on public health from antimicrobial resistance.

Keywords: off-label, veterinary medicine, drugs, antibiotics

ENHANCING SUPPLY CHAIN TRANSPARENCY THROUGH BLOCKCHAIN TECHNOLOGY

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ABSTRACT

Introduction: Global supply chains are under increasing pressure to demonstrate transparency, traceability, and ethical practices amid growing concerns about labor rights violations, environmental degradation, and fraudulent sourcing practices. Traditional supply chain systems often fail to provide the visibility and trust necessary to ensure accountability across all stakeholders.

Methods: A qualitative research design was adopted, utilizing multiple case studies across industries such as agriculture, fashion, and electronics. The study includes a comparative analysis of selected blockchain platforms—including IBM Food Trust, Everledger, and Provenance. Primary data was collected through semi-structured interviews with blockchain developers, supply chain managers, and sustainability experts.

Results: Findings suggest that blockchain significantly improves product traceability, reduces fraud, and increases stakeholder trust by providing real-time, verifiable information. However, adoption is constrained by high costs, technical complexity, limited interoperability, and uneven stakeholder readiness.

Discussion: While blockchain offers substantial potential to transform supply chain transparency, its effectiveness depends heavily on the implementation context and the specific platform used. The study highlights the need for industry-wide standards, better integration with existing systems, and inclusive adoption models.

Keywords: blockchain, supply chain transparency, traceability, ethical sourcing, platform comparison, digital transformation

THE QUALITY OF DIGITAL SERVICES AS A FACTOR FOR IMPROVEMENT OF STUDENTS' SATISFACTION

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ABSTRACT

Introduction: In the age of rapid technological advancement, one of the biggest challenges and priorities facing higher education institutions is the digitisation of student services. Students' opinions and satisfaction with the quality of digital services are the main focus of this study.

Methods: A substantial sample of students is given a standardised questionnaire as part of the quantitative research methodology. The purpose of the survey is to gauge the effectiveness, usefulness, and contentment of digital services. The data is examined using statistical methods to uncover trends, connections, and differences in students' perceptions.

Results: The anticipated outcomes are likely to reveal varying degrees of student satisfaction, pinpoint the most effective elements of digital services, and highlight areas that need enhancement. The results will offer valuable insights into students' needs and expectations.

Discussion: The analysis of the results aligns with the problem statement, yielding data-driven conclusions to enhance digital platforms. Limitations of the research are acknowledged, and suggestions for future research are provided, such as conducting longitudinal assessments of satisfaction and comparing institutions.

Keywords: Quality of digital services, student satisfaction, digitalization, service efficiency, digital services

VIRTUAL WORLDS, REAL HARMS: A COMPARATIVE LEGAL STUDY OF CRIMINAL LIABILITY IN DIGITAL SPACES IN LIGHT OF UN SUSTAINABLE DEVELOPMENT GOALS

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ABSTRACT

Introduction: Immersive digital environments, such as virtual reality (VR) platforms and large-scale online gaming worlds, are transforming social and economic interactions. Despite their rapid expansion, these environments are increasingly becoming arenas for crimes such as virtual sexual harassment, avatar identity theft, and digital property theft. This study aims to analyze how criminal liability is conceptualized across U.S., EU, and Asian jurisdictions and to assess whether current legal frameworks adequately address these emerging digital harms.

Methods: A doctrinal research design employing comparative legal analysis is used to examine statutes, judicial decisions, and regulatory approaches in U.S., EU, and Asian legal systems. The study explores how the legal principles of actus reus and mens rea apply to crimes committed in immersive environments, drawing on secondary data from crime reports, platform policies, and real-world cases.

Results: The findings reveal significant gaps in current legal frameworks. Existing laws insufficiently address psychological harm, identity theft, and economic loss in virtual spaces. Notable incidents include harassment reports in Meta's Horizon Worlds (2021) and frequent cases of avatar identity theft in VRChat and Roblox. Jurisdictional inconsistencies further complicate cross-border investigations and prosecutions of digital crimes.

Discussion: This research underscores the urgent need for a coherent legal framework that recognizes virtual crimes as genuine offenses. It directly relates to several UN SDGs: SDG 5 (Gender Equality), SDG 16 (Peace, Justice, and Strong Institutions), and SDG 9 (Industry, Innovation, and Infrastructure). The study highlights the necessity for interdisciplinary collaboration and coordinated international legal reforms to safeguard justice in increasingly digital societies.

Keywords: Virtual Worlds, Criminal Liability, Digital Harms, Identity Theft, Comparative Law, UN Sustainable Development Goals

RECONSIDERING LIBERAL PEACEBUILDING: GATEWAY TO BUILDING STABLE INSTITUTIONS IN STATE-WORN SOCIETIES?

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ABSTRACT

Introduction: The unexpected end of the Cold War exposed the political complexity, in which many frozen conflicts were unfrozen, and, given those circumstances, credible strategies for rebuilding societies and creating stable institutions in state-worn societies were necessary. This paper reconsiders the role of liberal peacebuilding as an inflection point in achieving peace, justice and strong institutions, a goal promoted in the 2030 Agenda for Sustainable Development.

Methods: Qualitative analysis of available relevant literature related to peace operations in Bosnia and Herzegovina and Rwanda, and evaluation of the possible impact of liberal peacebuilding in achieving positive peace as the ultimate goal.

Results: Qualitative analysis is expected to show that specific adjustments to the liberal peacebuilding concept can be applied to sharpened global geopolitical polarization.

Discussion: In accordance with the results of the qualitative analysis, the dynamics of liberal peacebuilding in the era of new geopolitical polarity and their contribution to the promotion of comprehensive positive peace in fragile societies will be discussed, explained, and potentially determined.

Keywords: United Nations, SDG, peace, strong institutions, liberal peacebuilding

THE POLITICAL POTENTIAL OF AGENDA 2030: RECONCEPTUALIZING SUSTAINABLE DEVELOPMENT THROUGH THE LENS OF POLITICAL RESILIENCE AND THE EFFECTS OF POLITICAL DIMENSIONS OF SUSTAINABILITY

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ABSTRACT

Introduction: This study examines the United Nations Agenda 2030 and Sustainable Development Goals (SDGs) through the lens of political resilience. While technical and managerial approaches often dominate SDG discourse, the political dimensions of sustainability remain underexplored. This research proposes an analytical framework emphasizing political governance, accountability, and inclusivity as critical factors for sustainable development.

Methods: A multidisciplinary political science approach was employed, combining comparative literature analysis, conceptual reconstruction, and critical discourse analysis. Data were sourced from UN official documents, academic publications, and analytical reports on SDGs.

Results: Integrating political resilience offers new insights into SDG implementation, beyond technocratic objectives. Key findings identify institutional resilience, inclusive political participation, and strengthened accountability as essential prerequisites for sustainability. Political dimensions—such as trust in institutions, quality of democratic processes, and capacity for inclusive policies—directly affect the success of Agenda 2030 initiatives.

Discussion: Findings confirm that sustainability cannot be reduced to indicators and technical targets alone; it requires deeper political engagement. Political resilience and consideration of political dimensions enhance critical reassessment of global development agendas. Limitations include reliance on secondary sources, suggesting the need for further empirical research across diverse national contexts.

Keywords: Agenda 2030, Sustainable Development Goals, Political Resilience, Institutional Resilience, Accountability, Inclusive Political Participation, Political Dimensions of Sustainability

CARBON FARMING: A GATEWAY TO PROMOTING SUSTAINABLE AGRICULTURE AND MITIGATING THE IMPACTS OF CLIMATE CHANGE IN THE SOUTHWEST REGION OF CAMEROON

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ABSTRACT

Introduction: Agriculture, which constitutes approximately 70% of Cameroon's economy, is grappling with substantial challenges posed by climate change. This study explores carbon farming practices, such as cover cropping, agroforestry, and reduced tillage, as climate-smart strategies to promote sustainable agriculture while mitigating the adverse impacts of climate change.

Methods: This study employs a mixed-methods approach, involving 27 semi-structured interviews with farmers, exporters, NGOs, and officials from the Ministry of Agriculture, as well as a focus group discussion with community stakeholders. Secondary data review and trade dataset analysis are also incorporated.

Results: 70% of respondents expressed willingness to adopt at least one carbon farming practice, provided they received adequate training and financial support. Most farmers expressed concern about the potential of reduced yields but were excited by the possibility of trading CO2 captured for extra income. Key barriers identified by Stakeholders include measurement, reporting, and verification (MRV), cost, and regulatory gaps.

Discussion: The study concludes that integrating carbon farming into Cameroon's agricultural strategy offers a practical pathway to achieving Sustainable Development Goals 2 and 13. Moreover, it positions Cameroon as a potential regional leader in climate-smart agriculture while balancing economic, environmental, and social priorities.

Keywords: Carbon farming, climate-smart agriculture, climate change, SDG2, SDG 13, adaptation, mitigation

TACKLING ORGANIZED CRIME AND THE NEED TO PROMOTE SUSTAINABLE DEVELOPMENT

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ABSTRACT

Introduction: According to the 2030 Agenda, "To achieve sustainable development, peace and security are necessary; and peace and security will be at risk without sustainable development." The paper will contribute to building Security, peacebuilding and resilience in the context of sustainable development.

Methods: When preparing the paper, the author uses general methods, including descriptive, normative, comparative, and content analysis methods.

Results: In the final part of the paper, the author concludes that the Global Initiative against Transnational Organized Crime builds a global strategic approach to tackling organized crime by strengthening political commitment to addressing the challenge, building an evidence-based base on organized crime, and developing networks of resilience in affected communities.

Discussion: The widening gap between crime authorities and resilience efforts highlights the urgent need to adopt practical strategies to combat organized crime globally. A primary tool for combating organized crime is the ability to develop and manage an effective response strategy.

Keywords: The Global Organized Crime Index, measurement indicators, Global Initiative Strategy (2024-2026)

CHALLENGES OF ADMINISTRATIVE DECENTRALIZATION IN GEORGIA

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ABSTRACT

Introduction: This study presents empirical results on the stages and features of the ongoing decentralization of local self-government in Georgia, which are determined, on the one hand, by the country's historical development and, on the other hand, by the current domestic and foreign situation. Empirical research evaluates the decentralization strategy in Georgia, the current decentralization process, its hindering factors and causes.

Methods: A mixed-methods approach was used to conduct the study. In the first stage, a detailed review of the document was conducted to analyze the context. Reports prepared by various types of research and non-governmental organizations. Qualitative data was collected. During the document analysis and interview process, special attention was paid to highlighting important cases under each task.

Results: Based on the research, appropriate conclusions have been drawn and relevant recommendations developed to accelerate and improve the pace of the ongoing decentralization process in Georgia.

Discussion: The interviews allowed us to thoroughly explore the means of maintaining power, as the theory of connection with the electorate suggests. The main finding of this study is that there are additional important internal factors that can significantly influence decision-making in sustainable development. There were certain limitations in the study's planning and implementation. Some limitations stem from the study design and the individuals involved, while others stem from the methodology. Future research should improve the understanding of issues related to sustainable development.

Keywords: Local self-government, Transparency, Citizen Engagement

MACROECONOMIC DRIVERS OF CO_2 EMISSIONS: IMPLICATIONS FOR LOW-CARBON TRANSITIONS

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ABSTRACT

Introduction: This study examines the macroeconomic variables affecting CO_2 emissions as a group of nations shifts to low-carbon economies. The effects of several important factors on emissions are investigated, including GDP per capita, the share of renewable energy, energy consumption, trade openness, foreign direct investment (FDI), government spending, public debt, and labor market dynamics (unemployment and employment rates).

Methods: Both Fixed Effects (FE) and Random Effects (RE) models are used in panel data econometrics to evaluate temporal relationships in the Western Balkan Countries.

Results: According to our analysis, the share of renewable energy and CO2 emissions is significantly inversely correlated, whereas GDP per capita and economic growth are positively correlated. Higher emissions are driven by trade openness and foreign direct investment (FDI), indicating that carbon-intensive production is. Government spending and public debt have complex effects, underscoring how difficult it is to align fiscal policy with low-carbon objectives. Patterns of energy consumption are also influenced by labor market conditions, specifically unemployment and employment rates.

Discussion: Policymakers can benefit greatly from this research's insightful recommendations for combining environmental and economic policies to achieve low-carbon, sustainable growth. It urges more investigation into how energy use, economic growth, and environmental sustainability interact, especially in developing nations.

Keywords: CO_2 emissions, macroeconomic factors, renewable energy, economic growth, trade openness, FDI, labor market, low-carbon transition

TOWARDS INCLUSIVE COMMUNITY LIVING: INTEGRATING GENDER EQUALITY AND SOCIAL INCLUSION FOR WOMEN WITH MENTAL ILLNESS

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ABSTRACT

Introduction: Mental illness is a growing concern, and women with mental health conditions often face extended institutionalisation even after clinical recovery due to stigma, rejection, and lack of rehabilitation support. This undermines their right to dignity and community living as guaranteed under Article 21 of the Indian Constitution and Article 19 of the UNCRPD. This paper critically examines the post-discharge realities of such women, linking the issue to SDG 3 (Good Health and Well-being) and SDG 5 (Gender Equality).

Methods: A mixed-methods approach combining doctrinal and empirical research was adopted. Quantitative data were collected from government sources, hospital records, and NGOs, while qualitative data were obtained through interviews with staff at the Regional Mental Hospital in Thane, NGO workers, and women who remained institutionalised post-recovery. Closed-ended questionnaires were administered to staff and volunteers in rehabilitation centers.

Results: Findings indicate that many women with mental illness are denied community living post-discharge, and government efforts to establish halfway homes and community-based facilities remain inadequate. Extended hospital stays are influenced by resource constraints, social stigma, and disrupted family relationships, limiting reintegration into the community. Limitations include potential data biases and a geographical focus restricted to specific regions in India.

Discussion: The study recommends a time-bound deinstitutionalisation policy, expansion of halfway homes, and a rights-based, gender-sensitive rehabilitation framework. Addressing the post-discharge needs of this vulnerable group is essential for achieving SDG 3 and SDG 5. Future research should explore regional variations and best practices from international contexts.

Keywords: community living, deinstitutionalisation, halfway home, rights-based, gender sensitive

MEASURING AND MOBILIZING EDUCATION FOR EQUITY AND SUSTAINABILITY

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ABSTRACT

Introduction: Education is a powerful instrument for fostering a more equitable and sustainable world. However, despite global progress, many individuals, particularly those from marginalized communities, still encounter barriers to quality education. This study examines how education systems can be better measured, supported, and transformed to advance equity and sustainability, in line with the goals of social inclusion and the United Nations' Sustainable Development Goals (SDGs).

Methods: The present study employs a mixed-methods approach, integrating qualitative and quantitative data to enhance the depth and breadth of the analysis. Surveys, interviews, and analyses of demographic data were conducted to assess educational equity across various contexts. Equity indices and case studies were used to evaluate how countries and institutions are tracking and addressing educational disparities.

Results: This paper asserts that, although numerous governments and organizations are making concerted efforts to advance educational equity, significant disparities persist, particularly along socioeconomic status, gender, and ethnic lines. Universities play a crucial role in providing innovative and high-quality education while leveraging tools such as EdTech and personalized learning to engage a more diverse student body. Data-driven strategies are essential for clearly identifying challenges and facilitating prompt, effective policy responses.

Discussion: The paper emphasizes the critical importance of accurately quantifying equity and leveraging that data to facilitate significant, constructive change. When integrated with innovation and inclusive practices, education serves as a potent catalyst for fostering sustainability and advancing social justice. However, limitations in current data and measurement techniques indicate a need for further research and improvement to support equitable education for everyone.

Keywords: Equity, sustainability, inclusive education, educational technology, data-driven policy

DEFINING A POSTHUMAN LEGAL PHILOSOPHY: OBJECT-ORIENTED ONTOLOGY AND THE FUTURE OF LAW

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ABSTRACT

Introduction: While the Enlightenment's anthropocentric worldview may once have served a progressive function, it now impedes the development of legal and political frameworks capable of addressing contemporary ecological, technological, and ethical crises. Therefore, this paper argues that the human person should no longer be treated as the sole axis of legal, political, and philosophical thought.

Methods: The paper, which adopts a rationalistic, positivistic, and inductive outlook, employs a qualitative research methodology and uses document analysis. Moreover, drawing upon posthumanist philosophy, the paper proposes a reconceptualization of legal theory through the lens of Object-Oriented Ontology (flat ontology), a framework in which no object (including the human) is ontologically privileged.

Results: This approach lays the groundwork for an ethical and melioristic legal framework that resists both the excessive idealism of Kantian cosmopolitanism and the entrenched pessimism of legal realism. Rather than asking how the law can serve humanity alone, this framework asks how the law can sustain and regenerate the conditions of shared life.

Discussion: From this perspective, legal systems should no longer revolve exclusively around human rights or interests, but instead reflect and respond to the broader milieu in which human and non-human entities coexist and interact. The implications of this approach for legislative, administrative, and judicial practice are profound: lawmakers must prioritize the sustainability and flourishing of the entire socio-ecological system.

Keywords: Enlightenment, Anthropocentrism, Posthumanism, Object-Oriented Ontology (OOO), Flat Ontology, Meliorism, Legal Philosophy, Future Legal Order

ENVIRONMENTAL CONSTITUTIONALISM AND THE SDGS: A COMPARATIVE STUDY OF INDIA AND BRAZIL IN ADVANCING GREEN GOVERNANCE

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ABSTRACT

Introduction: The rise of green constitutionalism highlights the constitutionalization of environmental rights as a fundamental aspect of sustainable government. India and Brazil, two significant democracies in the Global South, have incorporated environmental protection into their constitutional frameworks; however, they employ different legal and institutional strategies.

Methods: A comparative constitutional analysis is performed via a doctrinal examination of constitutional provisions, significant judicial rulings, and policy instruments in India and Brazil. Sources include constitutional documents, judicial precedents, and supplementary material on environmental governance.

Results: In India, Article 21 (right to life) has been expansively interpreted by the Supreme Court to embrace the right to a clean and healthy environment, reinforced by Directive Principles and public interest litigation. Brazilian constitutionalism clearly protects an ecological right in Article 225, and this protection is further strengthened by the Federal Supreme Court's active engagement in resolving climatic and environmental conflicts.

Discussion: The comparative results show that Brazil's textual guarantees make things clear and enforceable, whereas India's interpretative constitutionalism allows flexibility and creativity. Both models demonstrate the possibilities and constraints of green constitutionalism in promoting sustainability. The research contends that cross-jurisdictional learning can enhance constitutional responses to global ecological crises.

Keywords: Green constitutionalism, Environmental rights, India, Brazil, Constitutional Courts, Sustainable governance, Judiciary, Climate justice

IDENTIFYING VICTIMS OF ILLEGAL MIGRATION THROUGH AI: CHALLENGES AND ETHICAL CONCERNS*

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ABSTRACT

Introduction: In recent years, the rise of illegal migration has presented significant social and humanitarian challenges worldwide. The application of artificial intelligence (AI) to identify and assist victims of such migration offers promising avenues for intervention, yet it also raises critical ethical concerns.

Methods: This is a qualitative study exploring the multifaceted challenges of leveraging AI technologies in this field, including data privacy, bias, and the potential for misidentification. Furthermore, we investigate the implications of deploying AI-driven solutions within the broader context of justice and human rights, particularly for vulnerable populations.

Results: Through a comprehensive review of existing literature and case studies, this research highlights the need for ethical frameworks that guide AI deployment in sensitive contexts, ensuring respect for the dignity and rights of individuals.

Discussion: We conclude with recommendations for best practices that integrate technological innovation with ethical responsibility, advocating for collaborative efforts between governments, NGOs, and technology developers. Ultimately, this work aims to contribute to a discourse on how AI can be harnessed effectively and ethically to address the plight of victims of illegal migration.

Keywords: Artificial Intelligence, victims, migrant, human rights, ethics, migrants

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FOREST RIGHTS ACT, 2006: AN IMPERATIVE LEGISLATION FOR ACHIEVING SUSTAINABLE DEVELOPMENT GOALS IN INDIA

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ABSTRACT

Introduction: The Forest Rights Act (FRA), 2006, has a direct impact on approximately 350-400 million rural population of India, who are directly or indirectly dependent on forest land or forest resources for their sustenance and livelihood. This research article emphasizes the imperative role of FRA in achieving the Sustainable Development Goals (SDGs) for India.

Methods: This research article will analyze the implementation and design flaws in FRA by reviewing the literature on FRA implementation in India and how they are adversely affecting the achievement of the SDG goals in India. The research will analyze secondary sources, including reports by the Government of India, policy papers, journal articles, doctoral theses, and conference proceedings.

Results: The research article aims to highlight issues, such as the non-recognition of community forest rights, that affect the implementation of forest rights in India and thereby impact India's potential to achieve the SDGs efficiently and effectively.

Discussion: The research article argues that implementing the FRA, in letter and spirit, can help uplift approximately 25%-30% of the Indian population while helping India achieve the SDGs.

Keywords: Forest Rights Act, Sustainable Development Goals, India, Forest dwellers, forests

THE IMPACT OF SEA LEVEL RISE ON TRADE, FOOD SECURITY & ENVIRONMENTAL RIGHTS FROM AN INDIAN PERSPECTIVE

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ABSTRACT

Introduction: The Indian Ocean spans many countries with diverse laws, goals, and levels of development. Because of this, managing fisheries is difficult, especially because they are linked to food security, trade, and people's livelihoods. Rising sea levels from global warming are already reducing fishing areas, harming coastal communities and weakening local economies that depend on the Sea.

Methods: This study employs a doctrinal research method, analysing statutes, treaties, judicial decisions, and policy documents to assess the legal frameworks governing fisheries and marine resources in the Indian Ocean.

Results: The study finds that inadequate legal frameworks and climate impacts threaten fisheries in the Indian Ocean, requiring stronger cooperative laws, sustainable policies and adaptive strategies to secure livelihoods.

Discussion: The discussion centers on fisheries governance, climate impacts, legal frameworks, trade, food security, and sustainable policies in the Indian Ocean. Suggestions are provided to promote the development of laws and policies that would help achieve the objectives of strengthening the fisheries sector in India, advancing the blue economy, and ensuring sustenance for future generations.

Keywords: Ocean Governance, Indian Ocean and Island of India, Fisheries law, Blue economy, Katchatheevu dispute, Sea Level rise, Displacement, Social impact, Environmental justice

IMPLEMENTING THE PRINCIPLES OF SUSTAINABILITY IN DOMESTIC LEGAL SYSTEM – THE CASE OF INDIAN JUDICIARY

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ABSTRACT

Introduction: This paper explores the implementation of sustainability principles within the Indian legal regime, specifically focusing on treaties to which India is a signatory state. International law obliges states to fulfil their international commitments, but does not dictate how these obligations should be incorporated into domestic law.

Methods: The present paper uses the case study method, taking into account judgments reported and unreported by the Supreme Court of India and the High Courts that have upheld and observed the SDGs.

Results: This paper aims to demonstrate that the Indian judiciary is progressively and actively incorporating the principles of sustainability to achieve the SDGs, as evidenced in cases such as M.C. Mehata v. Union of India and Vellore Citizens Welfare Forum, in which the Indian courts have upheld the precautionary principle, polluter-pays principle, and the principle of sustainability.

Discussion: The integration of sustainability principles into the Indian legal system reflects a progressive step towards enhancing the constitutional mandate and statutory obligation. The judicial doctrines established through judicial activism have been instrumental in expanding the scope of Article 21 to reinforce sustainability as a fundamental legal obligation.

Keywords: Judicial activism, sustainability, environment

DIGITAL MARKETING AS A KEY FACTOR FOR COST REDUCTION IN COMPANIES IN THE REPUBLIC OF NORTH MACEDONIA

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ABSTRACT

Introduction: In the modern digital environment, digital marketing is a vital tool for improving competitiveness and streamlining business operations. This paper examines the impact of digital marketing on cost reduction for companies operating in the Republic of North Macedonia.

Methods: The research employs quantitative methodology, based on survey data collected from companies across different sectors. The data were analyzed using statistical methods in SPSS and Excel to identify significant relationships between the application of digital marketing tools and reductions in operational and promotional costs.

Results: The findings reveal that companies actively implementing digital marketing strategies experience substantial cost reductions compared to those relying on traditional marketing channels, as well as improved efficiency in customer communication. Among the most influential tools are social media, e-mail marketing, and search engine optimization (SEO).

Discussion: The study concludes that digital marketing is not only a promotional tool but also a strategic mechanism for cost rationalization and strengthening corporate competitiveness. These insights confirm the importance of digital transformation as a vital role for sustainable business growth in the Republic of North Macedonia.

Keywords: digital marketing, cost reduction, digital transformation, companies, SPSS analysis

THE RELATIONSHIP BETWEEN VIDEO GAMES AND AGGRESSIVE BEHAVIOR AMONG ADOLESCENTS (AGES 12-16): EVIDENCE FROM GEORGIA

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ABSTRACT

Introduction: In recent decades, interest in the psychological effects of video games has increased significantly, particularly regarding behavioral changes among adolescents. This study aims to examine the impact of regular exposure to violent video games on aggressive behavior among adolescents aged 12-16.

Methods: A quantitative research design was employed, utilizing standardized questionnaires, including the Buss and Durkee Aggression Scale and Anderson's Video Game Questionnaire. Data were collected from 110 adolescents residing in Tbilisi, selected through random sampling.

Results: A majority of adolescents (77%) spend more than 6 hours per week playing video games and frequently exhibit aggressive behaviors both online and offline. A significant association was found between competitive game engagement and impulsive actions. Data analysis revealed a positive correlation between the frequency of video game play and aggression levels ($r = 0.49$).

Discussion: These findings suggest that frequent video game use may be associated with aggressive behavior among adolescents. The study highlights the potential of video game engagement frequency as an indicator of aggression and underscores the need for further, comprehensive, multidimensional research.

Keywords: Video Games, Violent Video Games, Adolescent Aggression, Behavioral Development, Impulsivity, Parental Supervision, Developmental Psychology, Adolescent Psychology

HUMAN SECURITY AND SUSTAINABLE DEVELOPMENT

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ABSTRACT

Introduction: Sustainable development represents a shift in many areas in which humanity has been operating in recent years. This concept is closely linked to approaches to human security. These two elements help develop a world where people will function freely and without fear.

Methods: The study employs a mixed-methods approach, combining qualitative and quantitative methods to capture the multidimensional nature of human security and its link to sustainable development.

Results: Main results include: improving social well-being; increasing personal and community security; sustainable economic development; environmental protection and adaptation to climate change; and better governance and stronger institutions.

Discussion: Human security does not focus solely on protection from conflict; it also includes economic security, food security, health security, environmental security, personal security, and political security.

Keywords: Human security, sustainable development, environmental protection, analyzing data in North Macedonia

THE EU'S "GLOBAL GATEWAY" INITIATIVE AND GEORGIA'S TRANSIT FUNCTION: STRATEGY, INVESTMENT AND DEVELOPMENT

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ABSTRACT

Introduction: Modern geopolitical and geoeconomic dynamics are reshaping the significance of strategic initiatives worldwide. The European Union's Global Gateway strategy addresses these shifts by fostering sustainable, secure, and interconnected infrastructure in partner countries. For Georgia, the initiative has particular relevance, enhancing integration with the EU under the Eastern Partnership and strengthening its role as a key transit hub linking Europe, the Caucasus, Central Asia, and the Black Sea region. Recent U.S.-mediated developments regarding the Zangezur Corridor may significantly influence the Caucasus dimension of the Global Gateway. The study outlines key strategic implications for Georgia's transit and energy connectivity.

Methods: The study employs a qualitative approach grounded in EU policy documents, international reports, and academic literature, combined with a contextual geopolitical analysis of recent regional developments.

Results: The findings indicate that the Global Gateway enhances Georgia's potential to attract investment, modernise infrastructure, and deepen cooperation with the EU. At the same time, new geopolitical dynamics pose uncertainties for the Caucasus dimension of the strategy.

Discussion: This article examines the theoretical foundations of the Global Gateway, its sectoral priorities, and Georgia's role within the strategy. Special attention is given to the challenges and opportunities associated with developing Georgia's transit and energy potential.

Keywords: Global Gateway, EU-Georgia relations, Infrastructure development, Transit corridor, Energy security, Regional integration, Geopolitics, Eastern Partnership

BALLET AS A VEHICLE FOR THE SDGS IN GRADES 1–3

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ABSTRACT

Introduction: This study examines the educational value of ballet as a medium for operationalizing the Sustainable Development Goals (SDGs) in early primary education. The focus is SDG 4.7 and inclusive instructional design through Universal Design for Learning and culturally responsive pedagogy.

Methods: A design-based, mixed-methods study was conducted in three classes across grades 1, 2, and 3. Six micro-modules were developed on themes including clean water, life on land, responsible consumption, health and well-being, gender equality, and cultural diversity. Data sources included lesson plans, structured observation rubrics, student artefacts, and pre-/post concept checks.

Results: Preliminary findings indicate increased participation and on-task engagement for most pupils, with pronounced gains for pupils with Individual Education Plans. Students showed stronger operational command of key SDG concepts and more frequent collaboration and empathy in group compositions. Teachers reported reduced planning load when using reusable templates and visual cues.

Discussion: Ballet functions as an effective mediating modality for SDG learning when activities have a clear structure, multiple means of engagement and representation, and brief performance-based assessments tied to local contexts. Limitations include the small sample and short intervention period. Future research should examine longer-term effects and scalability.

Keywords: SDG 4.7, ballet, inclusive instructional design, UDL, early primary education, design-based research, performance-based assessment

INTERGOVERNMENTAL COORDINATION AND REINTEGRATION STRATEGIES IN NORTH MACEDONIA'S FIGHT AGAINST VIOLENT EXTREMISM

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ABSTRACT

Introduction: Current security challenges within the broader geopolitical context are significantly impacting North Macedonia. The objective of this study is to examine North Macedonia's strategies for countering violent extremism (CVE), reintegration of returnees, and improved intergovernmental coordination.

Methods: The research employs a qualitative approach, drawing on official reports, government documents, policy frameworks, and secondary academic sources related to North Macedonia's counter-terrorism and CVE efforts.

Results: Findings indicate that North Macedonia has established a reintegration strategy for approximately 40 of its citizens affiliated with the Islamic State. Around 50 individuals have been convicted of terrorism-related crimes. However, challenges persist, including lenient sentencing, limited reintegration outcomes, and weak interinstitutional coordination.

Discussion: While North Macedonia has introduced legal and financial measures to monitor returnees and initiated collaborative reintegration programs, these efforts remain fragmented. Overlapping competencies among institutions continue to obstruct efficiency. A proactive, well-coordinated approach is essential for strengthening resilience against extremism.

Keywords: North Macedonia, violent extremism, counter-terrorism, reintegration, Western Balkans

SNAPLOGIC AUTOMATION AS A CATALYST FOR ETL AND MACHINE LEARNING WORKFLOWS

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ABSTRACT

Introduction: This study explores the use of SnapLogic automation to modernize Extract, Transform, and Load (ETL) processes and support scalable machine learning (ML) workflows. Traditional ETL pipelines are slowed by manual intervention, inefficiency, and limited scalability.

Methods: Our methodology followed an applied research design, focusing on the practical implementation of SnapLogic automation for ETL and machine learning workflows. Automated pipelines were built to handle data preparation, model deployment, and performance monitoring, and were tested with both synthetic and real-world datasets.

Results: SnapLogic automation significantly improved efficiency, reduced development time, minimized manual errors, and enabled real-time processing of large, dynamic workloads. Continuous monitoring and automated lifecycle management enhanced system reliability and resilience.

Discussion: These findings demonstrate that SnapLogic directly addresses the limitations of traditional ETL by streamlining workflows and bridging the gap between data engineering and ML. While the platform may involve a higher upfront investment, it optimizes long-term costs for large organizations.

Keywords: Automation, ETL, SnapLogic, Machine Learning, Workflows, Enterprise, AI

ESG PERFORMANCE IN THE INSURANCE INDUSTRY: A STUDY OF THE REPUBLIC OF NORTH MACEDONIA

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ABSTRACT

Introduction: The integration of environmental, social, and governance (ESG) factors within the insurance industry is increasingly recognized as a key determinant of financial stability, competitiveness, and sustainable growth. This research investigates how ESG performance influences risk management, investment strategies, and product development within insurance companies in North Macedonia.

Methods: The study examines ESG integration by analyzing industry practices, regulatory frameworks, and stakeholder expectations in the North Macedonian insurance market.

Results: Findings indicate that ESG integration in North Macedonia's insurance sector remains at an early stage, with varying levels of maturity across companies. Environmental and social aspects are less developed compared to governance practices. However, a growing recognition of ESG's financial relevance is evident.

Discussion: The study concludes that ESG principles represent not only an ethical and regulatory requirement but a strategic imperative for the long-term sustainability of the insurance industry. Strengthening institutional capacity, regulatory frameworks, and stakeholder awareness is essential to accelerate the transition toward sustainable insurance.

Keywords: ESG principles, sustainability, insurance industry, risk management

THE RIGHT TO A TRIAL WITHIN A REASONABLE TIME AS A GUARANTEE OF LEGAL CERTAINTY IN CRIMINAL PROCEEDINGS

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ABSTRACT

Introduction: This paper addresses the right to a trial within a reasonable time as a central element of the broader guarantee of a fair trial. In criminal proceedings, the timeliness of adjudication is essential, as it directly affects legal certainty, the presumption of innocence, and the effectiveness of the defense.

Methods: The analysis relies on a normative and doctrinal approach, complemented by a comparative perspective. Relevant provisions of Serbian legislation and case law are examined, with particular attention to the jurisprudence of the European Court of Human Rights.

Results: The research shows that, despite continuous judicial reforms, the right to a trial within a reasonable time in criminal proceedings remains inadequately secured in practice. Excessive length of proceedings persists as a systemic issue, compounded by shortcomings in procedural safeguards.

Discussion: The findings suggest that the guarantee of a fair trial in criminal proceedings, when considered through the prism of timeliness, remains only partially fulfilled in Serbia. Effective protection requires consistent application of existing rules and the development of mechanisms to prevent and remedy undue delays.

Keywords: fair trial, reasonable time, criminal proceedings, legal certainty, European Court of Human Rights, Serbia

INNOVATIVE APPROACHES TO ORGANISATIONAL PERFORMANCE MANAGEMENT IN ORGANISATIONS IN NORTH MACEDONIA AND ITS CONTRIBUTION TO THE SDGS IMPLEMENTATION

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ABSTRACT

Introduction: This paper explores innovative approaches to organisational performance management and their contributions to achieving the UN Sustainable Development Goals (SDGs), with a focus on the North Macedonian economy.

Methods: The study employs a mixed-methods research design. The literature review provides the conceptual foundation, while empirical evidence is collected through surveys with structured questionnaires distributed to managers and executives, complemented by semi-structured in-depth interviews.

Results: Findings indicate that while awareness of sustainability is growing, organisations in North Macedonia often use performance measurement frameworks mainly for compliance purposes. Research results confirm that applying advanced performance management models leads to cost reductions, efficiency gains, improved reputation, and enhanced organizational resilience.

Discussion: The study concludes that embedding sustainability into performance management systems contributes not only to organisational success but also to broader societal and environmental goals. Future research should focus on sector-specific implementation strategies and longitudinal studies.

Keywords: organisational performance management, sustainability management, SDGs, performance measurement systems, organisational success

BEYOND THE RUNWAY: CAN EU'S SUSTAINABILITY LAWS SHAPE SOCIAL JUSTICE IN INDIA'S LUXURY FASHION SUPPLY CHAIN?

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ABSTRACT

Introduction: India is the world's largest exporter of hand embroidery, primarily to France and Italy. Luxury fashion houses have outsourced embroidery work to India since the 1980s, often keeping their Indian supply chain hidden. Without transparency, it becomes difficult to monitor ethical practices, leading artisans to work in poor conditions and receive inadequate wages despite the high prices these brands command.

Methods: At this stage, the study adopts a doctrinal legal research approach, critically analysing the text of the CSRD and CSDDD to understand their extra-territorial scope and normative implications for supplier countries.

Results: CSRD and CSDDD can have a potential positive impact on Indian suppliers if implemented across the entire supply chain.

Discussion: This doctrinal study will be further validated with empirical results. The study is limited to transparency, labour rights, gender equality, child labour, and workplace safety. Further study should focus on broader comparative analysis of supply chain laws across Global North countries to identify the most effective legal frameworks and evaluate their impact on Global South countries.

Keywords: luxury fashion houses, supply chain, EU sustainability laws, CSRD and CSDDD, India

DISINFORMATION AND DIGITAL TRANSFORMATION: IMPLICATIONS FOR THE EUROPEAN INTEGRATION OF NORTH MACEDONIA

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ABSTRACT

Introduction: This paper explores the dynamic relationship between digital transformation and disinformation, focusing on their implications for North Macedonia's European integration. The study addresses the increased presence of disinformation, low levels of media literacy, and challenges in aligning national digital policies with European standards.

Methods: A combined theoretical and empirical approach is applied. The analysis highlights the European regulatory framework, with emphasis on the Digital Services Act and Digital Markets Act. Empirical data are collected through media content analysis, surveys, and semi-structured interviews with citizens and experts.

Results: Findings are expected to show that disinformation, especially in the context of hybrid warfare, significantly influences citizens' perceptions. Effective digital transformation and alignment with European regulations reduce institutional and societal vulnerability. Media literacy emerges as a central factor of resilience.

Discussion: The study confirms that disinformation erodes confidence in EU integration, whereas digital transformation and regulatory harmonization enhance resilience. Media literacy proves essential, though limitations remain. Future research should extend to regional comparisons and the role of algorithms in amplifying disinformation.

Keywords: Digital transformation, disinformation, European integration, Digital Services Act, media literacy, hybrid threats

EMOTIONAL STUCKNESS AND THE ACCEPTANCE OF THE FERTILE VOID: A PSYCHOLOGICAL PROCESS OF GROWTH AND TRANSFORMATION

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ABSTRACT

Introduction: Emotional stuckness represents a state of inner blockage in which an individual feels unable to move forward psychologically or emotionally. This paper explores the relationship between emotional stuckness and the Gestalt concept of the fertile void—a psychological state in which emptiness is experienced as a potential space for creativity and transformation.

Methods: The study employs a qualitative and theoretical approach grounded in Gestalt and existential psychology, integrating phenomenological understanding and organismic self-regulation. Through analysis of theoretical sources and clinical insights, the paper illustrates the transition from emotional stagnation to self-integration.

Results: Findings indicate that conscious acceptance of the fertile void enables restoration of contact with authentic experience. When the individual stops avoiding emptiness, the void transforms from paralysis into a creative process, fostering self-regulation, emotional fluidity, and psychological stability.

Discussion: The fertile void is interpreted as a transitional phase essential to therapeutic and existential growth. Transformation occurs when control is relinquished and awareness unfolds naturally. Limitations include the study's theoretical nature; future research should empirically examine therapeutic applications.

Keywords: emotional stuckness, fertile void, Gestalt therapy, self-regulation, personal growth

TOGETHER FOR BETTER SCIENCE WITH THE MACEDONIAN ASSOCIATION FOR SCIENTIFIC COMMUNICATION

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ABSTRACT

Introduction: Scientific communication is fundamental to advancing science, increasing visibility, and integrating science into society. In North Macedonia, there is a recognized need for systematic support for scientists and for an institutional framework that promotes quality peer review, transparent knowledge dissemination, and open access.

Results: The Association was founded on June 10, 2025, by distinguished scientific professionals. Its mission is to ensure quality, visibility, and open access to Macedonian scientific output while aligning with international standards. The Association organizes training sessions, peer review workshops, seminars, conferences, and mentorship programs.

Discussion: Through its activities, MASC plays a pivotal role in overcoming structural barriers in Macedonian science, promoting intersectoral and international cooperation, and empowering early-career researchers. It strengthens scientific culture, supports ethical research practices, and increases visibility of national research outputs.

Keywords: scientific communication, open science, peer review, research visibility, North Macedonia

GLOBAL TRANSFORMATION OF THE WORLD AND WOW PARADIGMS TO MANAGE PANDEMIC AND VIRAL INFECTIONS

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ABSTRACT

Introduction: Rapidly changing epidemiological conditions, technological developments, and shifts in social paradigms are driving the development of new, innovative approaches—"WOW paradigms"—for managing pandemics, viruses, and infections.

Methods: The study examines global transformation approaches, including digital health, big data analysis, and artificial intelligence, as important tools for early detection and pandemic management.

Results: Health system resilience combines state policies and multinational cooperation, allowing innovative paradigms to be rapidly implemented. Global transformation includes not only technological progress but also adaptation of social, economic and political systems to global health challenges.

Discussion: Global transformation and WOW paradigms are not only necessary to manage pandemics, but are also important foundations for building sustainable, innovative and safe health systems. During the fight against pandemics, both individual responsibility and government action are crucial.

Keywords: Pandemic, COVID-19, WHO, Healthcare

PSYCHOSOCIAL FACTORS AND GENDER CHARACTERISTICS OF CRIME: THE SOCIAL AND CULTURAL CONTEXT OF GEORGIA

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ABSTRACT

Introduction: Criminal behavior is influenced by psychosocial and cultural dynamics that vary significantly across genders. In Georgia, criminological research has rarely applied a gender-sensitive lens, leaving a gap in understanding distinct pathways of male and female offending. Addressing this gap is crucial for aligning with UN Sustainable Development Goals (SDG 5: Gender Equality; SDG 16: Peace, Justice, and Strong Institutions).

Methods: The study employed a mixed-methods design combining literature review, semi-structured expert interviews with criminal justice practitioners, and analysis of Georgian legal and policy documents. The theoretical framework integrated anomie theory, social learning theory, and biosocial perspectives.

Results: Findings revealed distinct gender-related patterns of offending. Women's criminal behavior was more often associated with prior trauma and relational conflicts, while men's offenses were typically linked to impulsivity and peer influence. Judicial responses also showed gender differences in assessment and sentencing.

Discussion: The results highlight the necessity of gender-sensitive approaches in Georgian criminal justice policy and practice. Aligning reforms with SDG 5 and SDG 16 requires systemic integration of psychosocial support, equitable judicial responses, and rehabilitation programs that address gendered needs.

Keywords: crime, psychosocial factors, gender differences, criminal behavior, Georgia, SDG 5, SDG 16

A MULTIDIMENSIONAL FRAMEWORK FOR PSYCHOMOTOR REHABILITATION AND INCLUSIVE EDUCATION IN CHILDREN WITH CEREBRAL PALSY

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ABSTRACT

Introduction: Cerebral palsy is the most common cause of disability among children, often associated with psychomotor, cognitive and communicative impairments. Children with cerebral palsy face challenges in achieving functional independence and equal participation in educational environments.

Methods: A comprehensive case-based psychomotor evaluation was conducted on a nine-year-old girl with spastic diplegic cerebral palsy. The assessment used standardized measures, including the Gross Motor Functional Classification System, Manual Ability Classification System, Modified Ashworth Scale, and Pediatric Disability Inventory.

Results: The evaluation showed moderate psychomotor limitations affecting gross and fine motor function with reduced coordination, balance and manual dexterity. Cognitive assessment indicated low to normal intellectual potential, and expressive speech was impaired due to dysarthria. Adaptive strengths included visual perception and symbolic understanding.

Discussion: An integrated model combining individualized rehabilitation, assistive technologies, inclusive curricula, and family-oriented support shows potential to improve functional independence and educational participation. Sustainable development requires coordinated efforts across health, education, and social sectors.

Keywords: cerebral palsy, psychomotor rehabilitation, inclusive education, special education, rehabilitation

LIQUID GOLD, EMPTY POCKETS: WAGE DISPARITIES IN TEA ESTATES OF ASSAM

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ABSTRACT

Introduction: Tea, one of the most widely consumed and expensive global commodities, often commands extraordinary market value. Assam alone accounts for about 13% of the world's tea production. However, workers in Assam's tea estates receive daily wages far lower than both global counterparts and the price of a single cup of tea in European cafés. This disparity underscores structural inequality.

Methods: The study employs a comparative socio-legal and economic approach, drawing upon secondary data from government notifications, international reports, and scholarly writings. It juxtaposes Assam's wage framework with China's tea sector and analyzes historical perspectives on intergenerational marginalization.

Results: Preliminary findings reveal a consistent gap between the high global valuation of Assam tea and the persistently low wages of its workers. Comparisons with China highlight that Assam's wage structures fail to keep pace with either economic productivity or basic social security standards.

Discussion: The analysis demonstrates how entrenched wage disparity perpetuates poverty, poor living conditions, and exclusion from social mobility, thereby impeding the achievement of Sustainable Development Goal 10 (Reducing Inequalities). The paper argues for a rights-based reimagining of wage policies to ensure equitable valuation of tea workers' contributions.

Keywords: Assam tea workers, wage disparity, social security, SDG 10, marginalization, comparative study

CHANGES IN THE DIVERSITY AND ABUNDANCE OF MACROPHYTES IN THE LOCALITY EZERANI - LAKE PRESPA

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ABSTRACT

Introduction: The qualitative composition and abundance of macrophyte vegetation are among the most significant indicators of aquatic ecosystem health. Recent qualitative and quantitative assessments of macrophyte vegetation in Lake Prespa reveal a marked decline in both species diversity and abundance.

Methods: To evaluate the current ecological status, a comparative analysis was conducted between the latest field survey (September–October 2024) and a corresponding study carried out 13 years earlier at the Ezerani locality. Macrophyte specimens were collected using standard limnological techniques, and species abundance was estimated using a five-degree ordinal scale.

Results: The current survey recorded only three macrophyte species, in stark contrast to the ten species documented in the earlier study. This pronounced reduction in diversity and abundance suggests moderate to severe water pollution in certain areas of the lake.

Discussion: The degradation is further exacerbated by anthropogenic pressures and the ongoing water withdrawal, both of which contribute to the lake's deteriorating ecological condition. The findings underscore an urgent need for targeted conservation measures, as Lake Prespa appears to be facing a critical environmental crisis.

Keywords: macrophytes, diversity, abundance, Ezerani, Lake Prespa

ILLEGAL EXPLOITATION OF NATURAL RESOURCES AND ITS EFFECTS ON COMMUNITIES, CRIME, AND CONSERVATION IN INDIA: A COMPARATIVE STUDY

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ABSTRACT

Introduction: The illegal exploitation of natural resources, such as poaching, illegal mining, timber smuggling, and sand mining, is a major concern in India. These activities damage the environment, harm local communities, and often fuel organized crime.

Methods: This study adopts a comparative method using secondary sources, including government reports from India and other countries, research articles, and judicial decisions. Case studies from forest belts, mining zones, and coastal regions highlight how laws are implemented and where enforcement gaps are found.

Results: The findings reveal that, despite strong laws, illegal trade persists due to weak enforcement, corruption, and poverty. Communities that depend on forests and rivers face displacement and livelihood losses. Criminal networks benefit from activities such as wildlife trafficking and illegal sand mining.

Discussion: The study concludes that the problem is both legal and social in nature. More vigorous law enforcement, along with community-based conservation and livelihood alternatives, is essential. Comparative evidence shows that illegal activities are significantly reduced when local communities are included in decision-making. Hence, tackling illegal resource use requires an integrated approach involving law enforcement, community participation, and sustainable development.

Keywords: Illegal natural resource use, environmental law, communities, crime, conservation, India, judicial activism

SUSTAINING INTERNATIONAL PEACE AND SECURITY IN CYBERSPACE: THE ROLE OF EXISTING INTERNATIONAL LAW IN REGULATING CYBER OPERATIONS

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ABSTRACT

Introduction: Cyber operations have become a pivotal aspect of contemporary conflict and state interactions, raising critical questions about their regulation under existing international law. Ensuring a stable and secure cyberspace is essential for sustaining global peace, security, and sustainable development.

Methods: This study employs doctrinal legal analysis combined with case studies to examine the applicability of current international legal frameworks, specifically the UN Charter, International Humanitarian Law (IHL), and international human rights law, to cyber operations conducted by state and non-state actors.

Results: The analysis reveals that, while existing legal principles govern key issues such as attribution, sovereignty, state responsibility, self-defense, and thresholds for cyber attacks, challenges persist in applying concepts such as due diligence, distinction, and proportionality in cyberspace. The findings indicate gaps in legal clarity and in enforcement mechanisms that address the unique nature of cyber operations.

Discussion: The paper argues that reinforcing and clarifying the application of existing international law is vital for enhancing accountability and legal certainty in cyberspace. Strengthening these frameworks will support the sustainability of international peace and security, ensuring that cyberspace remains a stable domain conducive to sustainable development.

Keywords: Cyber operations, International law, UN Charter, International Humanitarian Law, Sovereignty, Attribution, Sustainable peace

IMPACT OF BURNING COAL FROM DIFFERENT MINES ON ENERGY BOILER PERFORMANCE

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ABSTRACT

Introduction: The original, high-quality coal designated for the design of North Macedonia's thermal power plants has been depleted. Current coal supplies are of inferior quality, characterized by higher mineral content and lower calorific value, resulting in significant operational challenges for boiler performance.

Methods: This study evaluates the strategy of blending existing low-grade coal with imported, higher-quality coal to improve fuel characteristics. The selection process for coal blending is analyzed based on coal properties, ash composition, and fusion temperatures. Operational implications are assessed through comprehensive calculations and performance data.

Results: The use of unblended, low-quality coal resulted in reduced boiler efficiency, limited power output, and increased stress on the fuel and ash-handling systems. Blending with high-quality coal improved the overall fuel characteristics. However, the analysis reveals that focusing solely on increasing calorific value, without considering ash behavior, can lead to severe slagging and operational issues.

Discussion: The findings demonstrate that optimal coal blending must consider a holistic set of characteristics, including ash chemistry and fusion temperatures, to mitigate slagging and ensure efficient boiler operation. A case study illustrates the negative consequences of selecting an inappropriate coal mix, underscoring the need for a comprehensive fuel management strategy.

Keywords: coal, boiler, efficiency, slagging, blending, ash composition

SUSTAINABLE DEVELOPMENT GOALS IN EDUCATION: SUPPORTING INCLUSIVE GROUPS (BASED ON THE EXAMPLE OF THE GEORGIAN TECHNICAL UNIVERSITY)

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ABSTRACT

Introduction: The paper aims to analyze the implementation of the Sustainable Development Goals (SDGs 4 and 10) at the Georgian Technical University, identify existing achievements and challenges in promoting inclusive education, and offer recommendations to strengthen the university's role in this regard.

Methods: The following research methods were used in the paper: Documentary analysis, Case Study, and Comparative analysis. Methodological framework: Qualitative approach and analysis based on theories of social inclusion and sustainable development

Results: Georgian Technical University has taken significant steps in promoting inclusive education. Technological and methodological adaptations are partially used at the university, although infrastructural problems still pose a serious challenge. To achieve SDG 4, the university can serve as a center for innovation, research, and community development, but this requires a more integrated approach and an efficient use of resources.

Discussion:

- Researching the role of universities in the realization of goals other than SDG 4 (SDG 5 – gender equality, SDG 13 – climate change).
- Empirical research on the experience of students (people with disabilities, ethnic minorities, socially vulnerable groups).
- The impact of international cooperation (Erasmus+, Horizon Europe) on inclusive education.

Keywords: Sustainable Development Goals, Inclusive education, Social inclusion

GAMIFIED ENVIRONMENT FOR BETTER PARTICIPANTS' ENGAGEMENT

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ABSTRACT

Introduction: The present study investigates the interplay between game mechanics and player psychology as fundamental determinants in the design of engaging, pedagogically effective gamified experiences. Central to this research are core mechanics such as balance, reward systems, progression structures, and the dynamic interaction between player behavior and game architecture. These components collectively underpin perceptions of fairness, sustain motivation, and facilitate long-term engagement.

Methods: A conceptual and analytical approach was employed to examine the constructs influencing gameplay. The analysis focuses on motivational dynamics, player typologies, satisfaction, immersion, and emotional response.

Results: The findings indicate that implementing techniques such as dynamic difficulty adjustment, narrative personalization, and social interaction mechanisms contribute to the development of adaptive systems that maintain player interest and promote meaningful engagement over time.

Discussion: The results underscore that equilibrium between mechanical structure and psychological responsiveness constitutes a central principle in effective game design. Such a balance not only amplifies entertainment value but also fosters cognitive growth, mastery, and sustained satisfaction. Consequently, integrating behavioral science into game design becomes a prerequisite for creating dynamic, transformative interactive experiences that transcend traditional boundaries of play and learning.

Keywords: Gamification, Game Mechanics, Player Psychology, Motivation, Engagement

THE LANGUAGE OF IMAGERY AS A COMPONENT OF THE PROFESSIONAL TRAINING OF FUTURE MATHEMATICS TEACHERS

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ABSTRACT

Introduction: The study examines the role of imagery in the professional training of future mathematics teachers. It addresses the fragmented and ineffective use of visual tools in mathematics education, which limits their potential as a system-forming component of the educational process. The purpose of the research is to substantiate the concept of the "language of imagery theoretically," define its structure (syntax, semantics, pragmatics), and develop approaches to fostering teachers' visual subcompetence.

Methods: The research is based on a theoretical analysis of scholarly works on visualization in mathematics education, including a historical overview (from antiquity to the present) and an examination of contemporary digital tools (such as GeoGebra, Desmos, and others). A structural-functional approach is employed to elucidate the components of the language of imagery.

Results: Strategies for developing visual sub-competence are proposed, including working with diagrams, creating interactive models, and employing analogies (for example, using folk proverbs to explain the monotonicity of functions). Recommendations have been developed for integrating the language of imagery into teacher training, encompassing instruction in syntax, semantics, and pragmatics, as well as the use of digital visualization tools.

Discussion: The findings confirm that the language of imagery is an effective tool for overcoming the abstract nature of mathematical concepts. Visual sub-competence enables teachers to transform complex ideas into accessible forms, thereby facilitating deeper comprehension among students. The study is theoretical; therefore, empirical validation of the proposed strategies is required.

Keywords: Visualization, Visual Sub-competence, Mathematics Education, Language of Imagery, Teacher Professional Training, Digital Tools

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